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PREFACE TO THE FIRST EDITION

THE primary object of this book is to place on record a brief, authentic account of my working life

The reader may feel that the three chapters which have been added at the end are an unusual feature for a work of this nature, as they deal with problems seemingly unrelated to the main purpose of this book. This, it should be explained, is an attempt, however brief and imperfect it may be, to suggest the application to the national life of the country of some of the lessons which I have learnt through experience and observation

Exceptional changes, some even revolutionary, have taken place during recent times and will continue to do so. The sub-continent of India has been partitioned and the senior partner, the Indian Union, has risen to the status of a Republic.

In point of working efficiency, sense of duty and standard of living there is marked disparity between the practices of present-day India and those of progressive countries, of which the United States of America is the most conspicuous example

The population of India in my own lifetime has doubled itself. Although the country is mainly agricultural, it is not producing enough food for its rapidly growing population. The working power in the country is alarmingly low. If any good is to come of independence, a speedy change has to take place in the people's habits, education, knowledge of world affairs, and working capacity. They have to work more and produce more. The economic policies of Government have also to undergo a radical change, if the struggle for existence is to be less severe, and prospects for the future more hopeful

India cannot afford to stand still and remain a planless under-developed country any longer. Its future safety will be imperilled unless large sections of its population become imbued with sound practical knowledge of world affairs and familiar with the latest business ideals, constructive views and creative power

A debt of gratitude is due to three or four friends who have read the book in manuscript and offered valuable suggestions for its improvement.

15th April 1951

M. V.

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FIRST ENTRY INTO GOVERNMENT SERVICE

It was in February 1881, in my twenty-third year, on completion of my education in Engineering in the Poona College of Science, that I received an appointment as Assistant Engineer in the Public Works Department of the Government of Bombay. In those days one such appointment in the Department was guaranteed every year to a candidate who headed the list of engineering graduates in the Bombay University. I took my degree in Engineering in November 1880 and joined Government service in March 1881.

I was first posted to the Nasik District. I had friends in Poona who were kind enough to give me all the advice and help I needed on first joining my appointment. The renowned leader of Poona of those days, Mr. Mahadev Govind Ranade, gave me a letter of introduction to an officer who held the appointment of Deputy Collector in Nasik. Other friends who took an interest in me in Poona also wrote to the Mamlatdar of Nasik commending me to his care on first arrival.

Within a few days of my assuming office in Nasik, the authorities of the Public Works Department changed their mind and transferred me to the neighbouring district of Khandesh which had the town of Dhulia for its headquarters. Here I was asked to work for a few days in association with Mr. W. L. Strange, a Senior Assistant Engineer, and then to relieve him. That officer was good enough to put me in the way of discharging the routine duties of my new office. After a few weeks of our association he was transferred to the Nasik District and for the first few months after his departure I carried out the duties of a small office which he left behind. This involved visits to irrigation channels in the neighbourhood and attention to repairs in progress to small anicuts and distributaries. My duties also included the supervision, whenever desired by the head of the district, of the work of subordinate officials who were attending to construction or repair works on the river channels on both banks of the Panjra River.

After a few months of work of this general nature, I was asked by the Executive Engineer for Irrigation, Khandesh and Nasik District, to construct a pipe syphon across a channel which carried water from the Panjra River to a village known as Datarti, some 35 miles west of Dhulia. The syphon had to be built to cross a tributary stream which joined the Panjra River between the channel head-works and the village where the water was required for irrigating crops. In former times, probably before the British Administration, there was a masonry aqueduct across this big stream to carry the channel in a trough-shaped masonry duct. This had been washed away and a syphon had been proposed in its place. The pipes required for the syphon had been ordered by my predecessor. Under instructions from the departmental head of the district, the local Sub-Divisional Officer transferred the work to me for direct execution. I went to the site of the work a little before the monsoon of 1884 and made arrangements for carrying out the work. The work to be done consisted in clearing sand from the bed of the stream and cutting a trench in rock to imbed the pipes. While rock-cutting was being carried out there were frequent showers of rain and the resulting floods bore large deposits of sand which filled the trench under excavation in the stream, consequently once every two or three days it became necessary to clear the deposit of sand before rock-cutting could be resumed. I was new to the work; I consulted the Sub-Divisional Officer in the neighbourhood as to how to get over the difficulty. He advised me to stop work and report that it would mean heavy expenditure to continue rock-cutting and preparing the bed for pipe-laying until the monsoon was over. After thinking over the matter for a time, I wrote to the head of the district, the Executive Engineer for Irrigation, Nasik and Khandesh District, mentioned above, explaining how carrying on this work in the monsoon meant wasteful expenditure and stating that I proposed to close the work and go back for the season to Dhulia which was my headquarters. I also stated I intended to return as soon as the monsoon showed signs of abating or as soon as conditions permitted me to resume work. The reply I received was in the form of a memo which I least expected. The memorandum insisted that the work should not be interrupted, and it ended with the remark :

"The Assistant Engineer is beginning his career badly as regards energy and obedience to orders"

This greatly discouraged me, and after thinking over the matter I wrote to the Executive Engineer that since his instructions indicated that he was particular that the work should not be suspended I intended to continue and complete it before returning to headquarters if no further unforeseen difficulties came in the way. I stated I would endeavour to carry out the work as economically as possible but hoped he would not mind if, under the circumstances, some unavoidable excess over the estimated expenditure was incurred.

In the course of a couple of months I was able, with the help of local masons and Bhil workmen, to complete the rock-cutting, and lay the pipes in position.

The syphon was completed and water of the irrigation channel was passed on from one bank to the other and continuous flow established.

While the work was being carried on, I used to go to it daily, crossing the river Panjra on horse-back. One day, after I had crossed the river at the usual hour in the morning, heavy floods came down which lasted for three or four days and cut off my return to the Travellers' Bungalow where I had my office and camp. There was no bridge anywhere near to cross the river. The work being executed was about $2\frac{1}{2}$ miles from the bungalow and the river Panjra intervened. Being prevented from returning to the camp, I spent the first night at Nandwan, a village close to the work, and the second day in the village of Datarti itself, for whose benefit the syphon was being constructed. The people of the latter village came in a body and offered accommodation and hospitality. On the morning of the third day I decided to return to camp by swimming across the river with the aid of my Bhil workmen and their crude rafts. My horse and saddle were taken across the flooded river by the same workmen.

It is sufficient here to state that the pipe syphon work I was engaged on was satisfactorily completed. On receiving a report from me to that effect, the Executive Engineer wrote to me cancelling the adverse remark he had passed in his memorandum quoted above.

After this I continued to do miscellaneous duties assisting the

Executive Engineer in inspecting works in progress under Sub-Divisional Officers. Some months later I was asked to take charge of a couple of fairly large canals which constituted a separate sub-division by itself at the south-east end of the district. The work here was of a routine character and uninteresting. The grants available for improvements were small and insufficient for efficient maintenance. From this office I was given an opportunity to officiate as Executive Engineer for Irrigation, Khandesh and Nasik District, for a few months during the absence on leave of the permanent incumbent. My headquarters during this short interval was Malegaon in the Nasik District.

My next job was to design a water-supply scheme for the town of Dhulia, including the construction of a small reservoir to impound the requisite storage. This project with report, plans and estimates was submitted to the Executive Engineer of the district who promptly obtained the sanction of Government. The construction of a reservoir to store water for Dhulia was put in hand under my supervision and made good progress. Leaving a capable graduate engineer in charge, I had also an opportunity of carrying out personally, that is, without the help of any subordinate, a survey for a new reservoir at the foot of the Satpura Hills in the north-west corner of the district.

I must add that the first Executive Engineer I worked under, Mr. H. G. Palliser, was good enough to write and ask me, in the eleventh month of my service in the district, why I had not applied for my departmental examination which would entitle me to confirmation in my office and to early promotion. All officers newly appointed, whether European or Indian, had to pass a departmental examination in practical engineering as well as an oral and written examination in the language of the district (Marathi) before they were confirmed or considered eligible for promotion. Usually it took two to three years for a new recruit to gain the necessary experience and practical knowledge to pass these examinations. There was no difficulty in my case to pass the language examination required but I doubted whether I could successfully pass the practical examination in engineering. It was very generous and broadminded on the part of the Executive Engineer himself to suggest to me to apply for the examination. I replied that I felt that my experience might not be sufficient to enable me to pass

the ; tactical test and so had not applied. He chided me mildly, stating that I ought not to develop a defeatist mentality so early in life. I applied for the examination. A committee of three engineers, including my own chief, passed me and I was not only confirmed in the service but was also promoted to the second grade of Assistant Engineers. Within 10 months thereafter I was promoted to the first grade, in which there were vacancies. Thus within 20 months of my entry into service, I reached the first grade which entitled me to a salary of Rs 500 per month.

On account of malarial conditions in the Khandesh District I did not keep fit for a time and therefore applied for a transfer. The Chief Engineer of the Central Division was kind enough to post me to Poona to work under the Executive Engineer, Roads and Buildings, of that district. Up to the date of this transfer, I was employed on irrigation and water supply works. This transfer gave me an opportunity to gain experience in a new branch of the Civil Engineering profession. I was for a short time in charge of Government House at Ganeshkhind, the headquarter buildings of the Provincial Government in Poona, and of other works under construction, including roads in the suburban area and surroundings controlled by Government. Here too the Executive Engineer of the Poona District tested me in several capacities and seemed to think well of me.

After I had completed a couple of years service in the Poona District, an enquiry came from the Bombay Government in 1893 for the services of an engineer officer for Sukkur in the extreme north of Sind. A European engineer who had been posted for constructing the water-works of that city died suddenly and Government wanted an officer who could take his place. My chief in Poona, Mr. E. K. Reinold, thought I was qualified to fill that office. He wrote offering me the appointment and asked for an early reply. As the letter is typical of the breadth of view and the generous attitude of that officer, I feel I should reproduce it *in extenso*.

POONA, 22nd March 1893

MY DEAR VISVESVARAYA,

I have been asked if I knew of a really good Assistant Engineer for a certain special work. The work is the "Water Supply and Drainage of Sukkur in Sind."

The pay will be Rs 200 a month in addition to your regular pay, plus 45 or 50 for house allowance. Would you like it?

I mentioned your name at once as fully capable of doing the work but of course I could not say whether you would consider it "good enough." The Sukkur climate is not exactly salubrious and invigorating, and the question whether Rs 200 is a fair equivalent is one for calculation and consideration.

Per contra, you would be to a great extent your own master, and the work would be both interesting and very instructive and might be very beneficial to your name and reputation

Think it over and let me know what decision you arrive at.

Yours sincerely,

(Sd.) E. K. REINOLD

After talking the matter over with friends and well-wishers, I accepted the offer and joined duty at Sukkur in February 1894.

The President of the Municipal Board of Sukkur, under whom I had to work, was a military officer. He was also the Collector of the Shikarpur District whose jurisdiction extended over the town of Sukkur, which was the headquarters of the district.

Water, which had to be supplied from the river Indus into the town water-works system, had to be pumped into a reservoir on top of a hill close to the river bank, locally known as "Edinburgh Castle Hill." The water of the Indus River, always muddy and discoloured, had to be filtered and purified before distribution to the city. At that time the City Municipality of Sukkur was not in sufficiently affluent circumstances to spend money on filter-beds. As an alternative, I decided to excavate a circular well in the river-bed itself close to the river bank to obtain spring water by percolation. The supply from this well was found insufficient, so a tunnel had to be driven from the bottom of the well for some distance under the flowing river. This tunnel brought a sufficient supply of pure water which was conveyed by a pipe into the engine sump well of the pumping station on the river bank. The water was then pumped into the pure water reservoir constructed on top of the "Edinburgh Castle Hill." A tablet is fixed on the outer wall of this reservoir which records the date of its construction and the

names of the principal Government and Municipal officers associated with the water-works

My work in this connection was completed in August 1895 when I proceeded on short leave

As Sind formed part of the Bombay Presidency in those days, the Governor of Bombay opened the water-works at Sukkur after I had left the station. In opening the works, the Governor, His Excellency Lord Sandhurst, observed:

"The history that you have read of those proceedings is extremely interesting. It shows that you took great care to obtain the services of the most able engineer that you could provide yourself with."

—(*Times of India*, 16th December 1895)

The Sukkur Municipal Board passed a separate resolution "placing on record their high sense of the valuable services rendered to this municipality by Mr Visvesvaraya in having brought to satisfactory completion with care, ability and zeal, and no small self-sacrifice, in the trying climate of Sukkur, the water works in a comparatively short time"

In passing on to me the above resolution, the Government of Bombay added, in their G. R. No 278E-1099 of 2nd August 1896, their own appreciation in the following terms:

"His Excellency in Council takes this opportunity of placing on record his appreciation of the services rendered by Mr Visvesvaraya on the Sukkur Water Works"

On return from leave I was posted to the Surat District in Gujarat. A water-works scheme was under construction for Surat City and work had just begun. The proposals included the construction of circular-shaped filtration wells in the bed of the Tapti River. The wells were sealed on top to prevent flowing water from getting in and pure water was obtained by percolation through the bottom sand-bed and conveyed through pipes into an engine sump well on the river bank. The design had been prepared by the Executive Engineer of the district and I was entrusted with the work of constructing the wells in the river-bed. At this juncture I was given an opportunity to officiate as Executive Engineer of the Surat and Broach Districts for a few months in addition to my normal duties on the Surat Water-works

After about 11 months' service in the Surat District I was again transferred to Poona as Assistant to the head of the Public Works (Chief or Superintending Engineer in charge) of the Central Division. As there was famine in parts of the Deccan, the Central Division Officer held charge also of Famine Irrigation Projects I worked for about 18 months in this capacity. My work consisted chiefly in the scrutiny of proposals received from the District Engineers, in some cases criticism and revision of projects received, and suggestions for new schemes of development. All this work was done under the supervision of the Chief or Superintending Engineer in charge of the Central Division, and in his name.

IRRIGATION ENGINEERING, WATER-SUPPLY AND DRAINAGE

From the office of the Assistant to the Chief (or Superintending) Engineer of the Central Division, I was transferred in April 1899 to hold charge of the Poona Irrigation District. This was the principal irrigation district then in the Bombay Presidency excluding Sind. It had two of the biggest storage reservoirs in the Presidency and the largest area under canal irrigation. The water-supply of the suburban area of Poona City and of Poona and Kirkee Cantonments also formed part of my charge. Poona City derived its water supply unfiltered, direct from the Mutha Canal which passed on the south side of the city and at a slightly higher level.

The first major problem experienced by me in the administration of the Poona Irrigation District was how to bring under control the irregular distribution of water to crops that was going on and its wasteful use by the cultivators. The distribution had to be controlled if waste of water was to be prevented. The cultivators were unaccustomed to control. The canal outlet sluices were kept in proper repair and supervision by the irrigation staff but the water admitted into the distributary channels was much more than was needed and was being wastefully used. The irrigation round about Poona City was in charge of a highly competent Indian Assistant Engineer, Mr. V. N. Vartak, who belonged to Poona City itself. This officer carefully attempted control and distribution of water by rationing on a 10-day rotation system. But the cultivators and owners of land, who were accustomed to take water whenever they liked, resented the control and there was an uproar. Complaints were made in the leading Marathi newspaper, the *Kesari*, a paper controlled at that time by the great Maratha leader, Mr. B. G. Tilak. The complaints were that unnecessary and arbitrary restrictions were imposed by the Government officials of the Irrigation Department who were under my control.

I submitted cuttings from the *Kesari* to the Government, explaining why control was exercised. It was also brought to their

notice that the owners of irrigated fields mostly belonged to Poona City itself and complaints were loud because they were influential. The Bombay Government replied that they had full confidence in the canal administration and that I was free to deal with the cases which came up according to my discretion.

Steps were, however, taken to explain the position to the cultivators themselves. I obtained the loan of the Fergusson College hall for holding a conference of owners of irrigated fields from Dr. (now Sir) R. P. Paranjpe who had newly taken charge as Principal of the college. The college was in the vicinity of the irrigated fields.

Meetings of the cultivators were held in the college hall. Both the leading cultivators and subordinate irrigation officials were asked to be present so that questions relating to alleged irregularities might be asked and answered. We also offered to gauge the water issued from every canal outlet in the presence of the cultivators themselves in each 10-day rotation and to maintain a correct relation between water issued from the outlet and the crop areas watered. Both the quantity of water issued and the areas of the different descriptions of crops watered would be taken into account from day to day. We offered not only to guarantee the same rate of supply of water that was found necessary for the area of crops at the time of the experiment but also undertook to add to it a reasonable percentage if the cultivators agreed to distribute the water themselves. Government were not only willing to allow the cultivators discretion to control the distribution themselves but also to pay the wages of a Patkari (water distributor) to be maintained by them. In the end, however, the cultivators were unwilling to take any responsibility of the kind suggested and strongly pleaded that the department should retain control.

The late Mr. N. C. Kelkar, the well-known colleague of Mr. B. G. Tilak, studied the problem, and being convinced that the measures taken were the right ones, wrote a series of articles in the *Kesari*, of which he was the editor, explaining the benefits of the action taken by the department. By all this open dealing and publicity the difficulties with the cultivators were solved. The cultivators adapted themselves to the rules issued by the Government Department and no more complaints were heard from them.

Visit of the Irrigation Commission

At this stage the Government of India, with the sanction of the Secretary of State, appointed the Indian Irrigation Commission to tour throughout India and advise Government on measures to be taken to expand cultivation of crops by irrigation. Sir Colin C. Scott-Moncrieff, a former eminent Chief Engineer in Egypt, was the President and other high Revenue and Irrigation Officers of the Central and Provincial Governments were members. In the Bombay Presidency proper, the Commission visited only the Poona Irrigation District, as it was considered, as already stated, the principal irrigation district in the Presidency. To make the position clear to the Commission I had to prepare a 'Memorandum on the Irrigation Works in the Bombay Presidency excluding Sind.' The principal object of this memorandum was to bring into relief the distinctive features of Bombay irrigation so that if their existence were considered as established, appropriate changes might be made in the system of administration, assessment and management of the works. The object was to improve the irrigation methods followed, increase areas of crops and revenue and thereby pave the way for expansion of irrigation in the Presidency. The Government of Bombay expressed their appreciation of the memorandum, stating, in their letter No 2699 of 18th April 1899, that "they have received your carefully written note and fully appreciate the pains you have taken in its compilation."

The memorandum seems to have made some impression. At a meeting of the Commission in Poona, I was questioned by the President for a couple of days on the various aspects of irrigation in the Presidency excluding Sind. At the close of the examination I was asked by the President, Sir Colin C. Scott-Moncrieff, whether I could furnish the Commission with a working scheme or system to make irrigation works in the Bombay Presidency more popular and profitable and yield a reasonable return on the outlay that Government had incurred on them. I agreed to submit a scheme in about three months' time.

The Commission visited the Nira Canal in the Poona District which was then in my charge. The entire Commission travelled in a boat on the canal for some distance. Lady Scott-Moncrieff, who accompanied the party, took a group photograph at the head-works. When the party was being photographed, I prudently kept

behind, but after we got into the boat in the canal, she asked her husband to sit beside me and engage me in a discussion of irrigation problems. While this discussion was going on a photograph was taken by Lady Scott-Moncrieff unknown to me. She then developed the negative and sent me a copy from Guntakal a few days later with the following inscription:

"A moment's remembrance of a discussion

With greetings from Lady Scott-Moncrieff "

I prepared a scheme as promised to the President of the Commission and submitted it within the time agreed. The name given to the scheme was "Block System of Irrigation." The Commission approved of the scheme submitted and recommended its adoption to the Government of Bombay, through the Government of India. In para 291, Part I of their Report (1901-03), the Indian Irrigation Commission have recorded their opinion on the scheme in the following terms.

"We have received from the Government of Bombay an able and interesting paper by Mr. M. Visvesvaraya, Executive Engineer, Poona Irrigation District, in which he has worked out all the details of the long-lease block system to which we have already referred with approval in our Bombay Chapter. The scheme proposed appears to us very complete and well considered, and although it has not yet been examined by the Government of Bombay, we think that the general principle is sound; and that, if some such system as that advocated can be introduced on the irrigation works of the Deccan, it will render them much more useful to the people and much more remunerative to Government. We hope therefore that it may be possible to give the system proposed by Mr. Visvesvaraya an early and thorough trial."

The object of the system, the Report states, is to distribute the benefits of an irrigation work over a larger number of villages and to concentrate the irrigation in each village within blocks of specified units and in selected soils and situations. The total area of the blocks in each village should be large enough to enable everyone who is able to grow an irrigated crop to have a share, but not too large a share to constitute a surfeit or lead cultivators to neglect the advantages of water-supply in good seasons as was being done.

Only one-third of the area in each block is to have sugarcane or other perennial crop at a time and in the remaining two-thirds either *rabi* or monsoon crop or vegetables may be grown up to the end of February. After February and till the outbreak of the monsoon water will be given only to one-third of the area, that is, to the area in which the perennial crop is grown. There would thus be a sort of triennial crop rotation in each block.

The Government of Bombay entrusted me with the responsibility of introducing the scheme on the Nira Canal. But both the Collector of the district and the Sub-Divisional Officer in whose jurisdiction the canal was situated were European officers who did not seem favourable to the scheme. The Mamlatdars and subordinate Revenue officials sided with them for a time. The village officials also, as was to be expected, were at the beginning opposed to it.

A Committee of two officers, one a Deputy Collector and the other an Engineer officer, was appointed at my instance to introduce the scheme. These officers, in their attempt to make it acceptable to the rural population, met with obstruction and reported to me that the Revenue officers of the district, the Collector and the Assistant Collector, did not encourage the introduction of the scheme. I asked the Committee to collect evidence and give instances of such obstruction. They went round and brought me the necessary evidence to show in what respects the civilian officers were obstructive. I submitted the evidence collected by the two officers to Government and requested them to stop the obstructive tactics of the officers mentioned or relieve me of the responsibility of introducing the scheme. The Government thereupon telegraphed to the civilian officers concerned to attend a meeting in the Secretariat, Bombay, and gave them printed instructions to co-operate with me and remove all obstacles to the introduction of the system that were complained of. Thereafter, I had every facility I needed to proceed with the introduction of the scheme. In due course the scheme was brought into satisfactory operation.

To induce the cultivators to adopt the scheme, I approached two influential landowners in the canal area and convinced them of the advantages of the system to themselves. When they and some of the other intelligent cultivators understood the principal object of the scheme, the Committee received cordial co-operation.

for its successful introduction into all parts of the canal area.

After the system was introduced and had worked for about four years, Sir John Muir Mackenzie, Senior Member of the Government of Bombay, spoke of the results of the system as follows at a session of the Bombay Legislative Council in Poona in June 1908:

"The case in favour of these (irrigation) works has been eminently strengthened by the complete success of what is known as the Block System of Irrigation on the Nira Canal which has succeeded in paying nearly $3\frac{1}{2}$ per cent on the capital outlay and we hope to see it paying 5 per cent. The development of this system is due entirely to the genius of Mr. Visvesvaraya, certainly one of the ablest officers, European or Indian, of the Public Works Department, with whom it has been my pleasure and honour to work."

(*The Bombay Government Gazette*, 15th August, 1908)

Patent Automatic Sluice Gates

It was found that the storage of Lake Fife at Khadakvasla was insufficient as a source of supply to meet the needs of the Mutha Canal and the water-supply to Poona City and Cantonment which depended on it. The reservoir overflowed every year up to a height of six to eight feet above the crest of the surplus weir. A system of automatic gates was designed by me to raise the storage water level of the lake permanently, by about 8 feet above the original surplus weir. This increased the storage in the reservoir by about 25 per cent. without raising the dam. The gates held up water in the lake till it rose to the full height of the previous floods but whenever water rose above that level the gates automatically opened and allowed the surplus water to escape. When water in the lake again fell below the 8 feet level over the surplus weir, the gates automatically closed and stopped further loss of water.

I took out a patent for the contrivance. The Government readily agreed to sanction this installation for Lake Fife Waste Weir but as the Chief Engineer at the time, Mr. W. L. Cameron, later remarked, I refused to ask for any royalty from the Government as the work was carried out under my own supervision. The gates were manufactured in Bombay by a European firm, Messrs. Geo. Gahagan & Co., and were fitted to the waste weir in 1901-03.

Although these gates were fixed in position more than 45 years ago, I found them working as satisfactorily as was needed when I recently visited the lake

Gates of the same pattern were subsequently adopted in consultation with me on the Tigua Dam Surplus Weir in connection with the water-supply of Gwalior and on the Surplus Weir of the Krishnarajasagara Dam near Mysore City.

Poona and Kirkee Water-supply

The bulk of the water-supply of Poona City was unfiltered canal water and the water-supply to the military stations of Poona and Kirkee was filtered; both were part of my responsibility for about six years. Several improvements had to be made to the Cantonment water-supply. Lord Kitchener, while he was Commander-in-Chief in India, twice visited Poona with a view to inspect and sanction improvements to the Cantonment water-supply. As the local civilian authorities had nothing to do with the water-supply to the Military Cantonment, the Governors at the time, Lord Lamington at the first visit and Lord Sydenham at the second, invited me to discuss the problems connected with the water-supply with Lord Kitchener. A third time I met Lord Kitchener under somewhat unusual circumstances. An ADC of the Governor, Lord Sydenham, came to my residence in Poona late one afternoon and stated that the Governor wanted me at Khadakvasla (Lake Pile) at about 5 in the evening. I pleaded that the officer then in charge of the Khadakvasla Lake was a different person and that I had been transferred to another office, namely that of the Sanitary Engineer to Government.

He, however, insisted on my going with him as the Governor wanted me to see him at the reservoir. On reaching the reservoir, about nine miles from Poona, the Governor introduced me to Lord Kitchener. I then realised that both the authorities had gone to Khadakvasla in advance to see the working of my Automatic Sluice Gates. After seeing the gates work and obtaining an explanation of their working from me they both returned to Government House at Ganeshkhind.

During my service in Poona I was invited to attend the Irrigation Conference held at Simla in 1904 at which engineers representing Irrigation Works in all provinces of India were present.

From Bombay, a junior European officer and myself were deputed to attend the conference. I submitted four papers to the conference, some of which were discussed at the session, and I believe all were published.

In 1901 the engineer who held the office of Sanitary Engineer to Government proceeded to Europe on leave and I was asked to hold acting charge of his office in addition to my duties as Executive Engineer, Poona Irrigation. Later on, in that capacity, I prepared a project for a modern pipe sewerage scheme for the first time for the city of Poona. When the scheme was discussed and sanctioned the Municipal Board was presided over by the famous Maratha patriot and leader, Mr. G. K. Gokhale.

I ought to mention that while serving in Poona I was in close contact with Government policies in the Engineering Department and had interesting work to do. My continuous residence in Poona for 10 years towards the end of my service in the Bombay Public Works Department afforded me much pleasant and profitable experience. Throughout this period I had the opportunity of working in close contact with European heads of the department who were broadminded and generous and I also had the feeling that I enjoyed the confidence of many of the leaders of the Indian community in Poona and the Deccan.

Poona was the seat of Government for three or four months of the rainy season every year so I had opportunities of coming into social contact both with high Government officers and leading Indian gentlemen who came from all parts of the Presidency, including Sind, to attend the special Poona session of the Legislative Council.

Chapter III

WORK DONE UNDER THE BOMBAY GOVERNMENT

I HAVE mentioned already that in 1901 I held the post of Sanitary Engineer to Government with the rank of Superintending Engineer for one year, during the absence on leave in Europe of the permanent incumbent of that office. This was, as stated before, in addition to my regular duties as Executive Engineer, Poona Irrigation District. It was in 1901 that I was given the permanent appointment of Sanitary Engineer to Government. My jurisdiction in Sanitary Engineering matters extended to all districts in the Presidency including Sind. The staff I had was insufficient to attend to all the work for which there was demand. Important water-supply questions like those relating to Karachi and Ahmedabad had to be dealt with by the Sanitary Engineer without the aid of efficient subordinate staff. I held the office of Sanitary Engineer for four years, during which period I had to recommend some original schemes and deal with current additions and alterations to water-supply and drainage systems of a large number of cities and towns within the limits of the Bombay Presidency.

Drainage and Water-supply of Aden

In the year 1906 the services of an engineer were required for the Military Settlement at the Port of Aden for the preparation of proposals for the drainage and the water-supply of that Settlement. Aden was then directly under the Government of India Military Department in matters connected with Defence, and under the Government of Bombay for Civil Administration.

At the instance of Lord Morley, the then Secretary of State for India, the Government of India asked the Bombay Government to depute a senior engineer officer to Aden to advise and report on problems connected with the sanitary engineering needs of the place. On being asked by the Government of Bombay to take up this work, I went to Aden in August 1906 and had the active help and assistance of the Port Officer.

The work I was entrusted with in connection with the deputation to Aden was :

- (1) To advise the Executive Committee of the Aden Settlement with regard to the drainage of Aden (water-supply was subsequently added at the instance of the Political Resident, Aden), and,
- (2) To represent the Bombay Government on a committee regarding the classification of roads and distribution of their costs of maintenance in the Military Cantonment of Aden

After some preliminary surveys and investigation, I submitted two reports in outline, one for the water-supply and the other for the sewerage of the Port of Aden.

Drainage was taken up first. In my statement on Aden Drainage in August 1906, I reported:

"The average death rate as already pointed out (Appendix II), is about 22 per 1,000 of population in Tawahi, 48 in Aden Town, 122 in Shaikh Othman; the average for the three stations is about 58. It is stated that on account of plague and a large influx of paupers into the settlement owing to disturbances and famine in the hinterland in recent years, the recorded figures for death rate are misleading as percentages of the normal population. Making all allowances for abnormal conditions, the rate seems high. For the sake of comparison it may be mentioned that the death rate in England and Wales during the last 20 years has been about 18 per 1,000. The death rate in recent years is about 40 per 1,000 in the Bombay Presidency and 30 to 35 for all India."

Some idea of the proposals made in connection with the drainage of Aden may be gained from the following summary:

"A system of pipe sewers is the only satisfactory method for the speedy removal of the sewage of the three districts

"The total cost of the project is not expected to exceed Rs. 4½ lakhs. The yearly charge for repayment of loan with interest and working expenses will amount to about Rs. 30,000. The incidence per head of population is comparatively very moderate because the sewage of Aden Town and Shaikh Othman can be led to the sea by gravitation and no costly works are necessary."

As regards the water-supply problem, the circumstances of Aden were explained by me in a report as follows.

"Practically no dependence can be placed on rainfall as a source of water-supply. The bulk of the water used by the military and the commercial classes consists of distilled sea water. There are several firms engaged in the manufacture of condensed water. The supply is supplemented by water, more or less blackish, brought from the mainland by an aqueduct, which is in charge of the military, and by carts brought from beyond the isthmus by private dealers.

"Condensed water is sold at the rate of Rs 3 per 100 gallons and other varieties of Shaukh Othman water cost from Rs. 1 to Rs 1-8. It is roughly estimated that the people in the peninsula, including the military element, spend not less than Rs 7 lakhs annually on their water-supply.

"A good water-supply is a desideratum, but the source will have to be sought on the mainland, perhaps in foreign territory. I have made no investigations, but speaking from general impressions, the initial outlay required to install a satisfactory scheme will be considerable.

"Having regard to the great demand for water in Aden, and the high prices people are able to pay for it, there is little doubt that a reasonable water supply scheme, if feasible, will prove remunerative.

"About 60 miles north of Aden there is hilly country in which there is an appreciable amount of rainfall. The water which runs down the hills enters a river channel and flows down it for some short distance. It does not end in the sea, as all well-conducted rivers do, but is absorbed in the sandy bed of the river in Lahej. One proposal was to construct closed underground wells in which to collect water in the river-bed by percolation and to pump that water through a pipe conduit a distance of about 18 miles to Aden. This scheme would have been quite satisfactory but the administration of Aden had to be conducted very economically and there was also the danger of the pipe supply being cut off by the unruly tribes inhabiting in or near Lahej."

I submitted, as already stated, two separate reports, one on

drainage and another on water-supply. A Government order followed in which it was stated that the Political Resident, Aden (Major-General E. De Brath), had recommended that proposals for both water-supply and drainage were badly needed and that—

"Mr. Visvesvaraya who was deputed to advise on the question of sewage disposal drew up a valuable report which was forwarded to Government with my No 452, dated 20th January 1907. Although an improved sewerage system was required, a pipe supply of fresh water was even more urgently needed "

In another resolution of the Bombay Government, dated 30th June 1909, subsequently received, it is stated that the Government ordered that detailed plans and estimates for the water-supply scheme should be worked out and that negotiations should be entered into with the Sultan of Lahej in regard to the construction of a well in Lahej, the acquisition of the land required and the future protection of the works

During my visit to Aden I was also asked to work as a member of a committee which had been set up to settle certain disputed points between the Government of India and the Government of Bombay in regard to the expenditure incurred on the roads of Aden

Kolhapur City Water-supply

I may mention here that I had occasion to visit Kolhapur two or three times to advise on measures to be taken to protect the earthen bund of a tank which supplied water to Kolhapur City. The Political Agent, Lt Col. W. B. Ferris, wrote to the Government of Bombay "that the earthen dam of the water supply reservoir was leaking badly and was in danger, that a large slip of the revetment of the entire slope of the dam had taken place, apparently from defective construction, seriously threatening its stability." He added, "It is of great importance that His Highness the Maharaja should have the best advice as to what is necessary to be done to avert a total loss of water-supply at present. We have a multiplicity of counsellors, but among them no wisdom, and therefore he is most anxious that Government may be pleased to let him have the services of an experienced European engineer

who will, after exhaustive scrutiny, tell him what is necessary and how it should be done."

I was deputed to Kolhapur and the local engineers faithfully carried out the works and repairs suggested by me. After some three visits I found that the earthen dam had been restored to a condition of safety.

After this, Lt.-Col. W. B. Ferris sent a copy of a letter in which the Dewan of Kolhapur had asked him "to convey to the Bombay Government the grateful thanks of the Durbar for the loan of the services of Mr. Visvesvaraya," adding that "the timely suggestions made by him were most useful. The Durbar is very happy to find that the work done under his general supervision has been thorough and it has withstood the abnormally heavy rains of last month. Mr. Visvesvaraya might, it is requested, be kindly informed that the tank is now quite full and the dam safe." In forwarding the Durbar's letter, Colonel Ferris made a request that "the thanks of the Durbar may be communicated to Mr. Visvesvaraya, Sanitary Engineer to Government."

Other Miscellaneous Engagements

According to a Government notification E-1325, dated 15th May 1907, I was placed in charge of three Superintending Engineer Divisions in the Bombay Presidency for about six months when Mr. H. F. Beale, Superintending Engineer in charge of the Southern Division and of the Projects Division, proceeded on leave. Both these charges were temporarily transferred to me for supervision and control in addition to my permanent charge of the office of Sanitary Engineer to Government. The Government order stated that "the arrangements placing the Godavari Mula and Kukari Surveys for protection works under the Superintending Engineer, Southern Division, as well as the surveys for protection works will continue." I had two official headquarters or offices in two places to look after, namely, Poona and Belgaum, during this interval.

While in Belgaum I took the opportunity of issuing a set of Road Maintenance Rules. I invited several subordinate officers in charge of roads to the headquarters in Belgaum, discussed previous orders which had been issued, and prepared a revised set of Road Maintenance Rules. These were subsequently printed and

circulated by Government to the three regular Public Works Divisions of the Presidency excluding Sind.

At about this time I had occasion to prepare water-supply schemes in outline for two towns in the Southern Division, namely, Dharwar and Bijapur. The details were worked out subsequently by the Executive Engineers of the districts concerned and the works carried out by them on the lines laid down by me.

The Governor of Bombay, Lord Sydenham, during his visit to Bijapur in October 1908, in reply to the Municipal and District Boards' addresses, referred to the water-supply of that town in these terms

"I recognise fully that the future of Bijapur depends upon the solution of this difficulty. The scheme prepared by that excellent engineer, Mr. Visweswaraya, with proposals for raising the necessary sum of four lakhs, is now under consideration"

The water supply scheme was subsequently sanctioned by Government. The Municipality communicated their acknowledgments to me on completion of the project.

As Sanitary Engineer to Government I was also a member and Secretary of the Sanitary Board of the Bombay Presidency. In this connection, I collected and issued printed statements of facts and figures relating to the water supplies of a series of towns in the Presidency proper.

Towards the close of my service as Superintending Engineer I was appointed member of a Committee to investigate and submit suggestions for the removal of unhealthy conditions in various parts of Bombay City. The President of the Committee was the Surgeon General to the Government of Bombay, Sir Pherozeshah Mehta, the renowned Bombay leader and patriot of those days, was also a member of that Committee.

From February 1905 the Government of Bombay placed me on special duty in the Secretariat in Bombay to work on certain irrigation projects which were awaiting the decision of Government. A Government order in May 1905 in this connection stated that "in addition to his duties as Sanitary Engineer to Government, Mr. M. Visweswaraya will continue to be employed on special duty in the Public Works Department Secretariat in connection with Irrigation Projects."

I was also asked to work on several committees when there were disputed technical and administrative questions to settle. A committee, of which the Director of Public Instruction, the Principal of the College and myself were members, was appointed to review the work that was being done in the Poona Engineering College and to revise the scheme of Engineering education in that institution. Till then the name of the institution was "College of Science." This Committee altered it to "College of Engineering" and also made suitable changes in the curriculum. The Committee's recommendations were approved by Government and carried out.

To show that Government were generous in their appreciation of the work I was doing for municipalities, I may quote what Lord Sydenham, Governor of Bombay, in the course of his reply to a Municipal address at Ahmedabad on January 28, 1908, said:

"The Municipality may count on the sympathetic consideration of the Government; but I need not tell you that it is essential to make certain that the new plans are the best possible and also that the administration of the water-supply should be placed on a sound economic basis.

"I venture to suggest that you should obtain the opinion of that most talented and experienced engineer, Mr. Visvesvaraya, who would be able to give you admirable advice in regard to these matters." —(*Times of India*, 30th January, 1908)

In September 1904 I was nominated a Fellow of the Bombay University. In communicating the nomination, the Private Secretary to the Governor of Bombay added that "His Excellency hopes that you will be able to find time to devote to the important work of framing University Regulations which will lie before the new Senate as soon as it comes into existence."

Chapter IV

SOME REMINISCENCES OF BOMBAY SERVICE

I SPENT nearly 14 years in the city of Poona while in service under the Bombay Government. My residence in that city was of special value to me in many ways. Poona was one of the three seats of Government in the Presidency, the other two being Bombay and the hill-station of Mahabaleshwar. I was occasionally asked to visit Bombay and Mahabaleshwar in connection with Government work. The European officers who held the highest offices under Government used Mahabaleshwar as the seat of Government in the hottest part of the year. As I have stated already, I was retained on special duty in the Bombay Secretariat for some 10 months in the year 1905. On the whole I was allowed a somewhat privileged position by having Poona as my headquarters for such a long period of Government service. During the four years I was a provincial officer, I had opportunities to travel on duty to most parts of the Presidency including Sind. All this varied experience gave me a good knowledge of the entire province, the working of its administration, and the political and social activities of the leaders of the country of those days—advantages which are not ordinarily vouchsafed in Government service.

Poona was also the permanent headquarters of several heads of departments including the Sanitary Engineer.

Poona was, in addition, an educational and intellectual centre and a good number of Indian officers who retired from Government service in those days settled down in this city. Professors of the Fergusson College and editors of newspapers and some Government officials took interest in politics and pleaded for extension of political privileges and for increased opportunities to the people of the country for service under Government. Among these, the principal outstanding personality was Mr. Mahadev Govind Ranade, a very able, well-informed, level-headed and cautious leader. He himself was a Government servant and was at the same time regarded as the friend, philosopher and guide of the enlightened public of Poona and Maharashtra. He was what was

known as a Liberal leader in politics not only in Poona and Maharashtra but also in the whole country. He took part in and presided over conferences in other parts of the country which pleaded for national or social reforms. Mr. Ranade regarded Mr. Gopal Krishna Gokhale in the light of his successor in politics, just as Mahatma Gandhi later regarded Pandit Jawaharlal Nehru as his successor to give effect to his political views. Mr. Ranade encouraged small industrial exhibitions and every kind of development for which there was scope in industry or trade, particularly in Poona and Maharashtra. He was constantly consulted informally by some princes, chiefs and senior political leaders in Bombay and other parts of India.

Mr. G. K. Gokhale was a professor in the Fergusson College for a good portion of the time he was in Poona and he also conducted the affairs of the Sarvajanik Sabha as one of its secretaries for some years. He later started the Servants of India Society which has attracted the services of a number of able, patriotic and selfless leaders from various parts of India. The *Journal* of the Sarvajanik Sabha was in reality conducted by Mr. Ranade, while the nominal secretary was a trusted old amiable gentleman named Shivram Hari Sathe. Articles of great value were published in English in that paper and, as far as I was aware, the Secretary did not know English. Mr. Ranade enlisted the services of contributors to the Sarvajanik Sabha journal from various parts of India but mostly from the division of the Presidency known as Deccan or Maharashtra.

I too was asked about 1893 to contribute an article to that journal and I wrote one on national uplift which Mr. Ranade looked over and had it published.

Mr. Bal Gangadher Tilak, the well-known political leader of the Deccan, took up an uncompromising attitude in criticizing British policies and methods of administration. He, therefore, spent several years in prison where he utilized his time in writing books on history and philosophy. He often ridiculed the mild tactics of the Liberal and Moderate Party leaders like Mr. Ranade and Mr. Gokhale.

About the year 1890 there were a good many educated people in Poona who were not disinclined to play the role of reformers. On one occasion, some 42 Brahmin gentlemen accepted the

invitation of a Christian organization to a tea party, as a result of which they were boycotted by the orthodox Brahmin residents of Poona. They were criticised in Marathi papers as *bechalis* (forty-two, that being the number which had attended the party) but it did not take long for the Poona public to adopt a more tolerant attitude towards these reformers.

The Deccan Club

While engaged in sports and moving with friends I was struck with the idea that a club on the English pattern was a desideratum in Poona. In the early days of my residence in that city I joined in games on local play grounds and in associations which were attended by Messrs Ranade, Gokhale and some local sardars and lawyers. The late Mr. Chintaman Rao Bhat, then a Subordinate Judge in Poona, and myself jointly issued a circular to the leading citizens on 11th July 1891 stating that we wanted to start a club and desired their co-operation. We went to Mr. M. G. Ranade and informed him of our proposal and requested him to secure for us an old building with an historical reputation, known as "Hira Baug." Mr. Ranade first thought lightly of the proposal and said that the Poona public spent their evenings generally in *for supari* parties and he doubted whether sufficient support would be forthcoming to run a club on European lines. As ill-luck would have it my enthusiastic colleague, Mr. Chintaman Rao Bhat, died of plague. Soon, however, some influential Parsi gentlemen residing in the suburban district of Poona joined me and the movement began to gain momentum and take shape.

We again approached Mr. Ranade who used his influence with the Hira Baug Committee and obtained that building for the use of the club. I circulated a pamphlet describing the aims and objects of the club and giving an estimate of the cost of running it. Two gentlemen, one Mr. Narayanbhai Dandekar, a retired Director of Public Instruction of Berar, and the other, Khan Bahadur Dinshaw D. Khambatta, a Parsi gentleman connected with the military services stationed in Poona, both agreed to join, and became joint secretaries with me. We then went into active preparations, circulated a notice among the leading citizens that the meeting to inaugurate the club would be held on 17th November 1891, and awaited events.

We had repaired and prepared the "Hira Baug" building for the occasion but at the advertised time of the meeting very few people were present. Fifteen minutes after the meeting commenced not more than 10 people out of the number invited had arrived; my heart sank within me, but in half an hour some 25 citizens collected and towards the close of the first hour there was a gathering of 60 to 70 of the leading men of Poona. It was not usual in those days for people to be punctual at meetings for they wanted to make sure that some well-known speakers had come to take part in the proceedings before actually walking in themselves.

The meeting was presided over by Sardar Rao Bahadur Gopalrao Hari Deshmukh, a retired District Judge, and was addressed by several leading men, among whom were Khan Bahadur Khaji Shahabuddin, C I E, a retired Dewan of Baroda, and the great leader, Mr. M G Ranade. The following observations made by Mr. Ranade in his speech at the meeting are taken from a Poona daily.

"Mr Ranade stated that at a previous attempt at starting a club in Poona 'some of their best friends at that time thought that it was a concerted move on the part of certain schemers who wanted to trap the others into doing what their caste rules prohibited them from doing.' Then he referred to some other clubs of which 'the members met and discussed and read and resolved.' The characteristics of all these clubs, he added, was that they were indigenous editions of what was essentially an European institution. The higher attempt which was now being made by the inauguration of the Deccan Club was nonetheless a very welcome movement.

"As regards the building, "Hira Baug," in which the club was located, he said-

"They had met on classic ground. In 1768, when the first Peishwa was engaged in fighting against Hyder at Seringapatam, he remembered a promise which he had made to his wife that he would build a suitable house in a nice garden where she might retire when he went on foreign expeditions. Remembering that promise when he was at Seringapatam, he wrote to his Minister about it and the Hira Baug was built. The house was built and the garden laid out by a prince for a princess. They were therefore fortunate in securing such a

place for their club—not as a permanent abode, however. The club hoped to secure a more conveniently situated place at an early date. Mr. Ranade then thanked the Honorary Secretaries for their labours and gave special credit to Mr. Visvesvaraya"—(*The Daily Telegraph* and *Deccan Herald*, Poona, 19th November, 1891)

Sardar Dorabji Padamji, a leading Parsi business man, was elected Chairman. Mr. Ranade and Mr. Gokhale were members of the Managing Committee.

As one of the Joint Secretaries I looked after the interests of the club till my services under the Government were transferred to Sukkur, in Sind, in 1891. When it became known that I was to leave for Sukkur, I was given a party by the members who presented me with an album containing their photographs as a memento of my services to the club.

The club, started in 1891, celebrated its golden jubilee 50 years later, in November 1911. Being an honorary member, I was specially invited to preside at that function which was attended by the leading citizens of Poona. Although there have been no phenomenal developments, the club is still functioning today and has thus been giving sport and pleasure to its members for nearly 60 years. The club continues to be housed in "Hira Baug," the same building in which it was inaugurated.

In the second half of the year 1898 I returned to Bombay after a visit to Japan. One evening I was invited to dine with Mr. M. G. Ranade who had by then risen to the position of Judge of the High Court and was residing in Bombay. We talked chiefly about progress in Japan. On my leaving, Mr. Ranade accompanied me to the outer landing steps of his house and on the way pointed to one of the rooms we passed and stated that a friend of his, a well-known educationist, Mr. Waman Abaji Modak, was confined to bed there. His exact words were "Do you know that there is a friend of mine in that room who is suffering from a disease from which all India suffers?" I learnt on detailed enquiry that Mr. Modak was suffering from paralysis.

It was the practice in Poona to hold a Durbar once a year at which an European officer, the Divisional Judge of Maharashtra, presided, and which was attended by two classes of invitees. chiefs

and sardars in one group and Government officers in the other. At one of these gatherings, the Indian Government officers were seated on the left row and the chiefs and sardars on the right. I happened to be seated next to Mr. Ranade in the front row on the left side. We had to sit fairly long with nothing much to do. Mr. Ranade related to me the history and some characteristic virtues and failings of some of the chiefs and noblemen who sat on the opposite row. When he had told me of the peculiar ways and habits of some half a dozen chiefs and sardars, I asked him whether he often visited them in social life, otherwise how could he know so much about their personal affairs. He replied, "I never go to any of them, but they come to me for advice when they have difficulties with Government, or any difficult problems in their own small States." This was characteristic of Mr. Ranade for, as stated before, he acted the part of a friend, philosopher and guide to the people of Maharashtra, a gentleman of great patriotism, great austerity and remarkable ability. Towards the closing years of his life he was looked upon, as he in reality was, as one of the greatest leaders that India had produced.

Although I held one appointment as Sanitary Engineer to Government, special duties and additional work were now and then entrusted to me. I have also mentioned that I had charge of three Superintending Engineers' Divisions for six months. About the year 1907 I was offered the post of Chief Engineer by two important States. When I brought this to their notice, the highest officers of my department in Bombay said that they were against my leaving the service of the Bombay Government and that I need not fear that my interests would be overlooked. For several years I had superseded a large number of seniors, at one time about 18 in number, on account of the special offices to which I was appointed. Government reverted some two or three of these officers to their former positions and I also learnt that there was some discontent on account of supersession. Remembering that there was political feeling in the country at the time, I thought there was little chance of Government appointing me Chief Engineer except when my regular turn came according to my original rank. I thereupon decided to retire from the service of the Bombay Government and applied for leave preparatory to retirement. There was some surprise in official circles when it was learnt that

although I had been given preferential treatment till then, I should have taken such a step. There were at the same time some well-meaning friends, even among high European officers, who did not like the idea that I should retire. Besides, I was not fully qualified by service for pension. Some official friends even expressed the fear that I might not get any pension at all. But the Government of Bombay in the end wrote to the Government of India in their letter No. 1086, dated 6th March 1908, recommending the grant of pension, and added:

"His Excellency the Governor in Council considers that the service rendered by Mr. Visvesvaraya has been exceptionally meritorious and fully entitles him to the additional pension."

That my services met with appreciation till the very end under the Bombay Government may be seen from a letter to me dated 18th June 1909 from Lord Sydenham, Governor of Bombay, from which the following extracts are taken:

"Had you remained in the service, it was my hope, if I stay on in India, to have been able to show my appreciation of your valuable services.

"The effect of your appointment in 1901 was therefore that you passed over many senior officers and I think that you will see that 'special consideration' was accorded at the time.

"Whatever you decide, I cordially wish you the success which I am certain that your great abilities and unvarying industry will bring to the crowning of your career and I hope that you will feel on reflection that your experience in Government service up to the present time has been exceptionally fortunate."

With this quotation, the account of my working life under the Bombay Government comes to an end.

Chapter V

SPECIAL CONSULTING ENGINEER IN HYDERABAD

THE river Musi passes through the city of Hyderabad (Deccan) and divides it into two parts. On the 28th September 1908, a cyclonic flood of unusual intensity passed through the middle of this city. The rainfall recorded at Shamshabad, one of the principal rain-gauge stations in the catchment area, was 12.8 inches in 24 hours and 18.90 inches in 48 hours. This fall resulted in the most destructive flood that had been witnessed in Hyderabad City for over three-quarters of a century. The northern bank of the river was on a lower level than the southern one. The river basin above the city abounded in small tanks, there being 788 tanks in a basin of 860 square miles, roughly at the rate of one tank for every square mile of catchment. The valley of the Musi River which caused this flood consisted of two rainfall basins—the Musi proper with a catchment of 285 square miles and the East with one of 525 square miles. From the levels marked by the flood it was calculated that the discharge began with 110,000 cusecs and rose to a maximum of 425,000 cusecs. In the valleys of these rivers every tank of any consequence gave way. In all 221 tanks are reported to have breached, of which 182 were in the East catchment and 39 in the Musi.

It was at this period that the Government of Hyderabad wanted an engineer to examine the damage done and to suggest measures to prevent a recurrence of such catastrophes.

While I was on leave preparatory to retirement and travelling in Italy, I received a letter at Milan from the Under-Secretary, India Office, London, which communicated the following cable received by him from the Governor of Bombay, dated 29th October 1908, and asked for an answer.

"Nizam's Government are anxious to secure services of Visvesvaraya, Superintending Engineer, on leave, to advise and assist in reconstruction of Hyderabad and prepare a drainage scheme. We would willingly lend him. Would you

ascertain whether he would return to India immediately for the purpose? Address c/o Messrs Thos. Cook and Son, London. The matter is urgent."

At about this time Mr. Casson Walker, Financial Secretary to the Government of Hyderabad, who was proceeding to England on leave, was also asked by the Government of Hyderabad to obtain the services of a competent engineer either in India or in England, to restore normal conditions in Hyderabad and to protect the city from future ravages by flood. Mr. Walker also accordingly got into communication with me from London urging that I should take up this particular special duty in Hyderabad.

When the enquiry came I was in Milan (Italy) and I replied to the Under-Secretary's letter agreeing to take up the work for a limited period provided I was not expected to join duty at Hyderabad for some five months thereafter. I continued my travels in Italy. From Milan I went to Florence, and as no further communication had come for over a fortnight, I wrote to the Under-Secretary of State from Florence that as my tour programme had been interrupted, my previous conditional consent to take up the Hyderabad offer may kindly be treated as cancelled. In the further correspondence that ensued, the Government of Hyderabad showed that they were particular that I should accept their offer and made some necessary modifications in the terms offered to make them convenient and attractive to me. Under the revised terms I agreed to join duty at Hyderabad on 15th April 1909, after completing my projected tour in the United States of America

I feel I should not fail to record a piquant incident which occurred in this connection.

A close friend of mine from my college days, Mr. Ibrahim Ahmadi, who had risen to the office of Executive Engineer, Presidency District, Bombay City, and who was also a brilliant architect, sent me, when I was touring in Europe, a cutting from the *Bombay Gazette* of those days, which had noticed my Hyderabad engagement when it came to be known, in these terms:

"What kind of expert this Indian engineer could be to demand and obtain the salary drawn by the Commissioner of a Revenue Division?"

Mr Ahmadi, who was a near relation of the late Sir Akbar

Hydari of Hyderabad, in forwarding the newspaper cutting, remarked :

"I was glad to read of your engagement in Hyderabad not because you got the post but because they have thought fit to confer this appointment on an Indian "

My special work in Hyderabad was :

- (1) To advise and assist in the reconstruction of Hyderabad City,
- (2) To frame proposals for future protection of the city from floods, and
- (3) To prepare a complete scheme of drainage for the Hyderabad City and Chadarghat.

On arrival there on 15th April 1909 I looked round for the staff required to undertake surveys for the two major schemes contemplated, namely, (1) a project for flood protection works, and (2) a modern drainage scheme for the city. Surveys were necessary for the preparation of plans and estimates for both these projects. Additional works like town planning, concrete roads within the city and other similar works were suggested later. But on this occasion attention was confined only to the two important projects which the Government of Hyderabad considered to be urgent.

The flood of 1908 at Hyderabad was, as stated before, estimated to amount to 425,000 cusecs, representing an annual run-off of $\frac{3}{4}$ inch per hour from a catchment of 862 square miles. The fall of rain was, no doubt, of exceptional intensity, but had many tanks not breached simultaneously and released unprecedented volumes of water into the river, the flood would not have risen to the extraordinary height it did and caused such great damage.

The flood occurred on Monday the 28th September 1908, as already stated, reaching its maximum height about an hour before noon. After midnight it developed into a cloud-burst. Rain descended in sheets, flooded the small tanks and overburdened their waste weirs. As a result one tank after another gave way and the flood in the city rose to unprecedented heights, many buildings in the populous quarters being demolished. In an area known as Kolsawadi about 2,000 people were stated to have been drowned or washed away.

A few engineers and a large number of surveyors and subordinates were required to carry on the necessary surveys and

Barrage and Canal Construction Works, near Sukkur, Sind.

The Easi Dam was constructed partly by Mr. C. T. Dalal and later by Mr. (afterwards Sir) Clement T. Mullings, the engineer who subsequently earned distinction by completing the construction of the Mettur Dam under the Madras Government.

Hyderabad Drainage Scheme

A second important scheme entrusted to me was the preparation of a modern system of sewerage for Hyderabad City.

The river Musi, as stated above, passes through the city and the sewers from both banks emptied into it. The river itself in this way was at times converted into a huge sewer, especially in the hot weather.

In the crowded back lanes the houseowners used to dig pits in front of their houses and allow the liquid refuse from them to fill these pits. The pits sometimes overflowed and sometimes dried up and thus became a breeding ground for mosquitoes. It was remarked at the time that a stranger visiting the city for the first time and insufficiently acquainted with the habits of the people, might suspect that "mosquito breeding" was one of the industries of the city.

The more important work that was first undertaken was the diversion of city sewage from both banks of the river through pipe ducts into a separate sewage farm. A site was selected for the farm on the left bank of the river and to the east of the city. The sewage from the south bank of the river was taken by a pipe across the river below the Chadarghat Bridge and conveyed to the farm mentioned in an earthen channel along with the sewage from the left bank.

My understanding with the Government of Hyderabad was that I should supply schemes both for flood protection works as well as for a modern sewerage scheme for the city. The two schemes were completed and printed reports of both together with plans and estimates were submitted to Government before I left Hyderabad. The report on the flood protection of Hyderabad was submitted on 1st October 1909 and that for reservoirs on the two branch rivers above Hyderabad on 20th October 1909.

A report in outline on the City Sewerage Scheme together with preliminary plans and estimates was submitted on 6th November

1909 All the slums which had proved a nuisance were brought into the scheme but as Government had no intention of financing a complete pipe sewerage scheme for the entire city all at once, many of the district sewers were left to be designed and constructed later after detailed surveys

At the request of the British Resident, a note on the Secunderabad Drainage was furnished to that authority on 4th July 1909 In a letter dated 18th October 1909, the Resident wrote to me:

"I have also to thank you for your very valuable report on our Cantonment Drainage Scheme which has been accepted by the Cantonment Authorities and which I think we now see our way to putting in hand."

I left Hyderabad service in November 1909 For 13 years thereafter I had no connection with the engineering works of that city In the year 1922, I was again invited to look into and advise on the drainage scheme, the construction of which was not progressing satisfactorily. To meet the wishes of the State, I paid some half a dozen visits to Hyderabad at intervals The principal works designed or carried out were the construction of a sewage farm and the laying out of proper sewers to carry the city drainage from both banks of the river to the farm The farm was located on the north bank of the river below and beyond the city Special attention was paid to the development of district or street sewers and house connections

During my visits to Hyderabad City for consultation, the Special Engineer who worked on City Engineering Works was Mr. M A Zeman (later Nawab Ahsan Yar Jung) who held the official position of Superintending Engineer in the State Public Works Department

During this, my second term of association with the Hyderabad State, I found the Easi Reservoir Dam was still under construction by Mr C T Dalal and the Musi Reservoir, constructed for flood protection, was being used also for water-supply to the city.

I understand that the aggregate outlay on works and improvements with which I was associated in the State till about the year 1931 came to about Rs 2½ crores

Before I ceased my connection with the city works, I complied with a request of the authorities in 1930 to supply, in the shape of

a report, a connected picture of the city's deficiencies and wants and the remedial measures and improvements which they called for.

There is much yet to be done, I stated, to improve the city. When the improvements suggested were carried out and the city was equipped with clean houses, flush-down lavatories, dustless roads, paved footpaths and a plentiful supply of open spaces, parks and gardens, it was thought Hyderabad would be able to hold her head high among her sister cities in India. Progress, it was stated, would be achieved only if efficient men were put in charge and funds to meet all reasonable demands allotted for expenditure from time to time

Before I close this chapter, I wish to place on record my indebtedness to Mr. (afterwards Sir) Akbar Hydari for the interest he took in the improvements to Hyderabad City and for the co-operation and help I received from him throughout my work in that connection

Chapter VI

WORK AS CHIEF ENGINEER, MYSORE

MR M. McHutchin, MICE, Chief Engineer, Mysore, was due to retire from service in June 1909. The question of appointing a successor was under the consideration of the Government of Mysore when I returned to Bombay from my American tour about the 10th April 1909. Mr. V P. Madhava Rao, CIE, who was Dewan of Mysore until 31st March 1909, had sent to my Bombay address a telegram asking me to join service as Chief Engineer, Mysore. As I had entered into a regular engagement with the Hyderabad Government I had to go there to fulfil it. Moreover, Mr. Madhava Rao had sounded me previously and knew I had no intention of joining the Mysore service.

After about a couple of months, Mr T Ananda Rao, who had in the meantime succeeded Mr. Madhava Rao as Dewan, sent me a letter on the 24th May 1909, in the course of which he wrote :

"His Highness would be glad to secure your services in view of your high qualifications and distinguished services and of the fact you are by birth a Mysorean.

"His Highness is confident that should you accept the offer now made to you, you will find ample scope both for your energy and talents in developing the vast irrigation of the land of your birth. His Highness is aware that you attach greater importance to opportunities for rendering public service than to mere official emoluments. Such opportunities will be open to you in works and projects which have to be carried out in Mysore."

As I had no intention of taking up service I asked for a fortnight's or three weeks' time to consider the offer before sending a reply. In the same letter I enquired "whether there was any prospect of Government encouraging industries and technical education in the State on a larger scale than they were accustomed to and utilizing my services in that connection." I added that I had made

a special study of those two subjects in my foreign tours. The reply I received was that such encouragement was in His Highness' programme and that His Highness would avail himself of my suggestions as opportunities arose.

I joined the Mysore service as Chief Engineer on 15th November 1909. Mr T. Ananda Rao, the Dewan, was very considerate and helpful during the whole time I worked with him. At the beginning I met with difficulties in making appointments. A high officer in the Public Works Department sent me a list of names of persons to be newly appointed and in support or justification he gave the names of several high officers in the State to whom the candidates were related or from whom recommendations had been received. The list had to be sent back to the officer for the names to be arranged according to the precise technical and educational qualifications of the candidates after further investigation. By enquiry and discussion, candidates were finally selected, priority being given to merit and qualifications as far as they could be ascertained.

Mysore had a large number of fine reservoirs and tanks, mostly of small size. A new reservoir of an unusual size had been constructed with a masonry dam, at a place called Marikanave, on the northern border of the State. Irrigation under this tank was being practised for some time. It was found that the cultivators were using the water none too economically and not by measurement and by this practice they not only failed to benefit the crops but had rendered the region malarial. When I heard of this, I tried to introduce the Block System of irrigation I had previously developed on the Bombay side with the imprimatur of the Indian Irrigation Commission of 1901-03, but the cultivators were secretly opposed to any change and, as had happened in Poona, the civilian officers also sided with them. There was a strong prejudice in favour of over-watering and as it was no easy thing to face opposition from both civilian officers and cultivators, particularly when I was new to the administrative practices of the State, the reform contemplated was not strictly enforced. I fear the irregular methods of water distribution under the Marikanave Reservoir have not received proper attention from responsible officials to this day.

His Highness the Maharaja encouraged the two developments I had urged prior to accepting office, *viz.*, technical education and

industries The Government appointed a committee for each of these. In regard to technical education, the committee consisted of Mr J Weir, Inspector-General of Education, and three other Indian officers of the State I worked as Chairman and our work resulted in a report which was submitted to Government in September 1912.

The Economic Conference

As regards industries and problems of economic value to the State, His Highness the Maharaja decided, at my suggestion, to establish an Economic Conference consisting of high officers of the Mysore State as well as leading non-official gentlemen in order to discuss and determine the action to be taken to promote matters of pressing importance His Highness the Maharaja himself inaugurated the Conference on 10th June 1911 with a notable speech, from which the following extracts are taken

"Education is the sovereign remedy for all economic ills Much has been done by my Government in recent years by giving increased grants and otherwise to spread knowledge and awaken the intelligence of the people To mark our sense of its importance we have given the subject of education the first place in the general programme placed before you

"In starting investigation into the economic condition of the State, we shall be practically enquiring into the causes of ignorance, poverty, ill-health and premature deaths I have already referred to These calamities must exist in some degree in every country and at all times, but our object must be to minimise them The times are changing The progress of communications has annihilated distance and is causing increased competition in agriculture and manufacturing pursuits The race is for the skilful and the strong We cannot hope to succeed if we continue to work with antiquated tools and follow old-fashioned business methods"

From that time onward, the Economic Conference continued to function as a regular State institution during my term of office in Mysore After my retirement from State service I believe it continued to function for some time In recent years, the Conference has functioned with varying fortunes according to the interest taken by persons who held the highest offices in the State

While preliminary steps were being taken to give an impetus to industries it was thought that an independent expert should be appointed to give his full time to the work. His Highness the Maharaja agreed to obtain the services of Mr (afterwards Sir) Alfred Chatterton from the Madras Government. Mr. Chatterton's services from Madras were available because, as was well-known at the time, Lord Morley, who was then Secretary of State for India, had decided to abolish the Department of Industries in that province.

On joining the Mysore service Mr. Chatterton was first appointed on special duty and also as a member of the Industries Committee of the Economic Conference of which I happened to be the Chairman. He was a highly qualified and able officer but he interested himself in some specific industries only like pumping engines, small power plants for rural industries, sandalwood oil factory, etc. He could not be induced to take interest in iron and other mechanical engineering industries which the State wanted to establish.

Railways

I ought to add that I was also Secretary to Government for Railways during my period of office as Chief Engineer of the Public Works. Railway construction had been at a standstill for over 15 years previously and it was thought necessary to extend the railway system and take over the management, which till then was under the Madras and Southern Mahratta Railway Company, direct into the hands of the Mysore Government. Accordingly a Memorandum on Railways was drawn up which laid down the lines of policy to be pursued, and which provided for the construction of additional railways and also for the future operation of open lines till then under company control—all by State agency.

The Cauvery Reservoir (Krishnarajasagara)

The next important project that I took up was the construction of a reservoir dam across the river Cauvery. About the year 1902 Hydro-electric Works had been constructed at the Sivasamudram Falls on the Cauvery to utilize the natural flow of the river for power generation. On an average about 13,000 h p was being generated of which 11,000 h.p. was supplied to the Kolar Gold Fields

at a distance of about 90 miles from the Sivasamudram anicut. The supply at Sivasamudram fluctuated, sometimes going down so low as less than 100 cusecs. There was a proposal to build a reservoir at a village called Kannambadi, about 10 miles west of Serinagapatam, but no design of practical value had been actually prepared. Fresh surveys were undertaken for constructing a large reservoir, with a view to utilizing the storage both for power generation and irrigation on an extensive scale in the Cauvery Valley. As I had visited large irrigation dams like the Assuan Dam in Egypt in the course of my tours and I had also done some work connected with designing large reservoirs in the Bombay Presidency and in Hyderabad, it did not require much time for me to prepare suitable designs and a complete project both for irrigation and power generation best suited to the requirements of the Cauvery Valley in Mysore.

The Sivasamudram Hydro-electric Power Station had been constructed during the term of office of Sir K. Seshadri Iyer as Dewan with the help of the Public Works Department under the special supervision of Major A. C. J. De Lot Biniere, R.E., then Superintending Engineer in the State service.

The Managing Agents of the Kolar Gold Fields found the power supply they were receiving insufficient and unreliable on account of the varying small flow at Sivasamudram in the hot weather. As I was also Secretary to Government in the Electrical Department, I discussed the power supply problems with the representatives of the Managing Agents, Messrs. John Taylor and Sons of the Kolar Gold Fields, in association with Mr. H. P. Gibbs, the Chief Electrical Engineer. After this discussion, the size of the reservoir as well as the stages of construction necessary were fixed with a view to supply water both to Sivasamudram Power Station and for all irrigation that could be practised in the Cauvery Valley within the Mysore State.

A masonry dam, 124 feet high, was designed to hold a storage of about 48,000 million cubic feet of water. This was to be utilized to irrigate eventually 150,000 acres of land and generate power to the extent of about 80,000 h.p. Apart from the supply to the Kolar Gold Fields, there was demand for additional power to meet the requirements of lighting and industries in the towns and cities situated in the river valley.

The design aimed at the construction of a lake with a masonry dam, 8,600 feet long, 130 feet high above the river-bed and 140 feet above the lowest foundation. The bed width at the foundation level was 111 feet. The catchment area of the river above the dam site was found to be 4,100 square miles and the average annual flow of water through the river gorge at the dam site was estimated at 220,000 million cubic feet.

The hydro-electric power supply in the pre-reservoir period was, as stated already, 13,000 h.p., of which 11,000 h.p. was made available to the Kolar Gold Fields. Messrs John Taylor and Sons, Managing Agents of the Kolar Gold Fields, asked for additional power to the extent of 5,000 h.p. for five years and of 10,000 h.p. later, subject to notice being given in the near future. Enough water was provided in the reservoir to generate up to 20,000 h.p. in the first instance at Sivasamudram, including the power which was being previously supplied. Another project was also planned to generate power more advantageously below but close to the Sivasamudram Falls, at a place called Shimsha. It is enough to state here that when completed these two stations were expected to generate 80,000 h.p. This supply is now being fully utilized.

I must state here that after the reservoir project was ready, no sanction was forthcoming from His Highness the Maharaja for some time. Some of the officers of the State, perhaps, dissuaded His Highness from spending as much as Rs 25½ lakhs, which was the estimated first cost of the project at the time. Such a large amount the State had never spent before on any single project. The Dewan, Mr T. Ananda Rao, was, however, wholeheartedly in favour of the proposal. When I felt that I might not be able to influence His Highness the Maharaja, the thought occurred to me of retiring from the State service. I took short leave and proceeded to Northern India on a holiday. On my return I found there was no change in the atmosphere and no enthusiasm for new works and schemes. In these circumstances I kept aloof and confined my activities for some time only to the punctual execution of the routine duties of my office.

Noticing my altered attitude His Highness the Maharaja sent for me while he was camping in Bangalore and enquired why I was not interesting myself in new works and developments as I used to do before. I told His Highness the truth, that I was disappointed

with the facilities given me to carry on new works and progressive developments. As there was no work in the State to be enthusiastic about, I wanted to leave the service. His Highness' reply was. "Don't be hasty, I will do what you want." He asked me to meet him at the capital (Mysore City) the following week. There His Highness was pleased to adhere scrupulously to his promise and sanctioned, after full enquiry, every one of the proposals I had submitted to Government. The principal proposal amongst them was the reservoir scheme. I did not know whether His Highness the Maharaja or his other advisers consulted outside engineers or not, but it served my purpose to find that the scheme submitted by me to Government was sanctioned without any addition, omission or alteration.

The next difficulty on the reservoir scheme was with the Government of Madras. That Government had prepared a project of its own for a reservoir on the same river at Mettur, about 60 miles below Kannambadi, measured along the river. The impounding of the waters of the higher valley made this scheme unworkable because they could not get all the water that they had hoped to store. When our reservoir was proposed, they had to change their designs, which they were unwilling to do for some time. We appealed to the Government of India and insisted on our securing our rightful share of the waters of the valley. We had carefully calculated what that was. I believe the Government of India engineers were favourably impressed with our claim. We appealed to Lord Hardinge, the Viceroy, to permit us to proceed with the construction. This permission was given; but it was for the first stage only, namely, a height of 80 feet. We nevertheless started building the dam with the bottom width required for the full height we had originally designed, namely, 124 feet. Construction was started with a wider foundation and we stated that as we believed our claim was correct and just, we took the risk. Eventually, as a result of the award by an Arbitration Committee, we were able to proceed with the work according to our original design. We had the goodwill and support of Lord Hardinge, the Viceroy, and of Sir Hugh Daly, the British Resident in Mysore, to both of whom our grateful acknowledgements for helping us in this matter are due.

The following extract taken from my address to the Mysore

Representative Assembly on the 7th October 1916 explains the points in dispute which were referred to the Arbitration Committee, and their award.

"There appears to be considerable misconception, particularly among the inhabitants of the Cauvery delta in the Tanjore and Trichinopoly Districts, regarding the effect of this award. Statements have been made in the Press and at public meetings that the decision has been too favourable to Mysore and injurious to the interests of Madras. This view probably found currency with the public, partly on account of the technical character of the points involved in the dispute and partly because, owing to the delicacy of the situation, it was not possible to contradict earlier the one-sided agitation that has been going on in the Madras Presidency.

"At present the total area irrigated in the Cauvery Valley within Mysore territory is 115,000 acres. The corresponding area in the lower reaches of the river within the Madras Presidency is 1,225,500 acres; that is to say, 92 per cent of the area irrigated by the river lies in the Madras Presidency and only 8 per cent. in Mysore.

"Three-fourths of the total water-supply of the river passes through the Mysore territory, but, as stated above, the benefits derived by the State are wholly incommensurate with the high proportion of the total flow contributed by Mysore.

"A large surplus flow in the river goes to waste into the sea, year after year, after meeting the needs of both Mysore and Madras irrigation. The Mysore project is intended to store only a small portion of this surplus.

"While the Mysore reservoir is intended to hold a storage of a little over 48,000 million cubic feet, proposals have been matured by the Madras Government for constructing a reservoir of double this capacity practically from the same catchment at a point within the Madras Presidency just outside the Mysore boundary.

"The extension of irrigation proposed within the Mysore State is only 150,000 acres. The Madras project, on the other hand, contemplated the extension of the already large irriga-

tion in that Presidency by 320,000 acres, that is to say, by more than double the area which will be irrigated by the Mysore reservoir.

"These two facts, viz., that there is ample surplus water in the river and that the Madras Government had themselves proposed the construction of a storage reservoir of a capacity double that of ours and for the irrigation of more than double the area contemplated by us, afford unmistakable proof that, with suitable regulation of storage, the construction of our reservoir would in no way interfere with the existing irrigation. It is admitted on all hands that Madras is entitled only to as much water as is required to safeguard its existing irrigation."

When we promised that the storage reservoir would be constructed by 1st July 1915, Messrs John Taylor and Sons felt sceptical as regards our capacity to do the work in time. They had also under consideration an alternative thermal power station. When, however, the work was completed and water was supplied to the power station according to promise, the Company expressed their satisfaction at the work that had been done and conveyed their deep obligations to His Highness the Maharaja.

In the very first project report submitted by me on 5th May 1911, my anticipations on the prospects of the scheme were expressed in these words:

"Once commenced, the scheme opens up a vista of possibilities of ever-increasing value to the State. But the speed with which developments take place will not be spontaneous, but must depend entirely on the energy and foresight displayed by the responsible Government in improving the market for power and extending irrigation. Having regard to the indirect revenue to the State by the increase in the productive power of the country, a work like this would be justified even if it paid no more than 3 per cent. But the promise of extraordinary direct returns from power at commencement, and the opportunity it affords of building up a great irrigation project from the sale proceeds of power, form a combination of advantages rarely vouchsafed to such undertakings in any part of the world."

This reservoir work has certain unique characteristics found nowhere else in India, and they are:

- (1) It is the largest reservoir ever built in India up to the date of its construction in 1912, either during the British Administration or before

Note: The Mettur Reservoir on the same river, built by the Madras Government, is much larger, but its construction commenced in July 1925, i.e., some 13 years after the Mysore Reservoir was put in hand.

- (2) A tunnel, about $1\frac{3}{4}$ mile long, has been pierced through a hill range to take the left bank Cauvery Canal through It is believed to be the largest irrigation canal tunnel found anywhere in India.
- (3) The Krishnarajasagara Scheme partakes of the character of a multi-purpose project It may be regarded in essence as a miniature T.V.A. (Tennessee Valley Authority) Scheme in America.

The functions it performs are .

Nearly 100,000 acres of land are already brought under irrigation—more will follow.

It supplies power to the gold fields in the Kolar District.

It supplies electric light and power to the cities of Mysore and Bangalore besides a large number of towns and villages in the State

It has led to the extensive cultivation of sugarcane which, combined with power, has rendered possible the Mysore sugar mills industry, one of the largest of that class of mills in India. It produces power to run the cotton mills in Mysore and Bangalore and various other industries of lesser importance.

- (4) Some three years ago, the Chief Engineer in Mysore furnished, at my request, a statement of the economic purposes served and the remunerative character of the scheme to the State. The capital invested in the entire scheme was about Rs 10½ crores The direct and indirect benefits to the population amounted to about Rs. 15 crores a year and the Government was getting

an annual revenue (taking both direct and indirect revenue into account) of about Rs 1½ crores, representing nearly 15 per cent on the capital

Chapter VII

SITUATION IN MYSORE WHEN I ASSUMED OFFICE OF DEWAN

Fifty Years of British Administration

THE State of Mysore was under direct British Administration for 50 years between 1831 and 1881. The Rendition of the Government to the hereditary ruling family took place on 25th March 1881. Till then a large number of roads and some 50 miles of railway had been constructed and a modern system of administration, including educational institutions, had been introduced. In other respects the State may be said to have been brought under a Law and Order Administration.

There was a severe famine in 1876-78 which crippled the State's resources both in men and material. In the words of Mr. C. Rangacharlu, the first Dewan after the Rendition, the famine "cost the State 160 lakhs of rupees, involved the Government in a debt of Rs 80 lakhs and withal deprived the province of a million of its population, and crippled its resources for years to come." Owing to the disastrous effects of the great famine, whatever benefits the British Administration had brought in were not appreciated to their fullest extent at the time of the transfer in 1881.

Thirty Years of Administration with Indian Dewans

The Indian Dewans who subsequently held office from 1881 onwards under the rule of the Maharajas, or the Regency of Her Highness the Maharani, continued to carry on the administration with unimpaired efficiency. At the same time they imported a progressive outlook by the improvements and changes they introduced in some of the departments of the State.

Among the larger developments and outstanding achievements under the regime of Indian rulers may be mentioned the establishment of a Representative Assembly at the time of Dewan C. Rangacharlu in 1881 and the execution of the Cauvery Hydro-electric Scheme at Sivasamudram, the Marikanave Reservoir and

extensions of channel irrigation in places along the Cauvery, Kabini and Hemavati Valleys during the Dewanship of Sir K. Seshadri Iyer. The cities of Bangalore and Mysore were improved and extended. The railway lines, which were 50 miles in length in 1881 with an invested capital of Rs. 25 lakhs, stood at 411 miles with an outlay of Rs. 250 lakhs in 1910-11. The provincial road mileage was also doubled during these 30 years.

A Legislative Council was established in 1907 during the Dewanship of Mr. V. P. Madhava Rao.

A few statistics of the period which I gave in my first address to the Mysore Representative Assembly may not be without interest in this connection. The population of the State, which in 1871 was 5,055,402, fell to 4,186,188 in 1881 on account of the famine of 1876-78 and rose again to 5,806,193 in 1911, showing an increase of 15 per cent. over that of 1871. This was probably because some of the people who had left the State during the famine returned to it with better times.

The town population, which in 1881 was computed at 13 per cent., fell to 11 per cent. in 1911, probably for want of sufficient occupation in towns.

The population dependent on agriculture rose from 33 lakhs in 1881 to 42 lakhs in 1911. As regards agriculture, the occupied area excluding coffee was 4,213,505 acres in 1881-82 and 7,438,463 acres in 1911-12, an increase of 79 per cent. The growth of agriculture after the Rendition had been extensive but not intensive.

The total revenue of the State, which amounted to about Rs. 50 lakhs at the beginning of the last century, was Rs. 101 lakhs in 1880-81 and rose to Rs. 247 lakhs in 1910-11, including what was known as the "fortuitous revenue" from the gold mines. The expenditure also had more than doubled, viz., from Rs. 101 lakhs in 1880-81 to Rs. 223 lakhs in 1910-11.

The expenditure on education from all sources rose, as should have been expected, from Rs. 3,91,028 in 1880-81 to Rs. 18,79,135 in 1910-11, and its cost per head from Re. 0-1-6 to Re. 0-5-4. The school-going population had increased from 53,782 in 1880-81 to 138,153 in 1910-11 or nearly 2.6 times.

A few industries, small and large, including the gold mines of Kolar and the manganese mines of Shimoga and a few cotton mills had come into existence. But most of these were

unconnected with local enterprise and in themselves afforded no evidence of the progress of the people either in technical skill or co-operative enterprise.

How I Found Mysore on Assuming Office

In November 1912, His Highness the Maharaja was pleased to call upon me to take over the office of Dewan in succession to Mr T. Ananda Rao, C I E Though I was anxious to have opportunities to render what service I could in improving the economic conditions of the country and its people by promoting industries, education, and other developments, I was not desirous of taking up any high office as such It may be remembered that, prior to my accepting the offer of the Chief Engineer's post, I had asked for opportunities of developing technical education and industries in the State. On this occasion too, when the office of Dewan was offered to me, I suggested to His Highness the Maharaja that it would be sufficient if I were appointed a Member of the Council in charge of Development Departments and thus given opportunities for promoting education, industries and other beneficent activities in the State His Highness the Maharaja was, however, insistent that I should accept the office of Dewan and I eventually welcomed the offer for the opportunities of service it gave me The following extract from my speech in reply to the address presented to me soon after my assumption of office of Dewan by the Mysore Engineers' Association, at a meeting on the 30th November 1912, presided over by Mr. V. P. Madhava Rao, gives expression to my true feelings when I took over the Dewanship:

"I notice that, in your address, you refer to yet higher honours and rewards for me. It will, I hope, not be regarded as an affectation of modesty on my part if I say that all I have wanted is opportunity for work and that thoughts of personal advancement have not influenced my actions in recent years With the important duties now graciously entrusted to me by His Highness the Maharaja, I have all the scope for work that I may have ever longed for."

I may add that the office of Dewan had all along been held by members of the Civil Service and my appointment to it from the ranks of the Engineering profession caused some surprise in

official circles but it occasioned no curiosity or comment among the general public in Mysore

When I took up office, the great deficiencies and needs of the people which attracted my attention were

Low level of education,

Lack of initiative, ambition and power of organization,

Lack of capacity for planning among the leaders, and,

Low economic condition and absence of any effort on a planned basis for improvements and developments

My one aim, therefore, was to plan, promote and encourage developments chiefly in education, industries, commerce, and public works to enable the people to work well, earn well and live well. No time was lost in drawing the attention of the officers of the State and of the people to the main deficiencies in their living conditions and to the necessity for improvement and progress similar to what I had noticed in Japan, Western Europe and America

In my very first address to the Representative Assembly in October 1913, these were referred to as follows

"It is not difficult nowadays to construct public works, railways, tramways or other public utility works, because skilled agencies can be imported for the purpose. Foreign capital can be obtained if we are able to guarantee a fair return on the outlay. It is also easy to man the public service with the best talent available in India or, for that matter, of the world, because there is an abundance of such talent seeking employment. The help of outside agencies which, while benefiting themselves, are also likely to benefit us, should be welcomed. But large enterprises carried out entirely with outside help will not increase the capacity of our people or raise the status of the country. And, unless in the fiscal and geographical area known as Mysore, the intelligence of the people, the natural resources and the available capital act and react on one another, and that with cumulative effect, the country cannot be said to be making any permanent progress

"There are certain features in our present condition which necessitate anxious watchfulness on our part. The country has no doubt progressed within the past 30 years,

but the advance is due to the general progress of the Indian Continent, as a whole, rather than to any organised activity or design on our part.

"Only one person in every sixteen is able to read and write. The cultivators are not fully occupied even in normal working seasons; in years of scarcity for months at a time they are left without occupation and without hope. Three-fourths of our population are dependent on agriculture and the great bulk of them live in villages without activities or aspirations outside their individual households. Our land-owners are small men, our business is conducted by small traders and artisans, each working singly for himself. The lessons of co-operation and organization have not permeated even the top strata of society.

"The first Dewan since the Rendition, with the experience of the famine of 1876-78 fresh before him, drew attention to a similar state of things then. In his address to this Assembly in 1881, Mr. C. Rangacharlu strongly urged the need for industries and industrial development, remarking that no country can prosper unless its agricultural and manufacturing industries were equally fostered.

"He was also of opinion that 'when all the world around is making marvellous progress, the 200 millions of people in this country cannot much longer continue in their long sleep, simply following the traditions of their ancestors of 2,000 years ago and earning a miserable subsistence, ready to be crushed on the first occurrence of a famine or other calamity.'

"These words are as true today as they were when they were uttered 30 years ago and, unless a change is attempted, they will continue to be true 30 years hence.

"We must develop the life and capacity of our people by encouraging in them self-help, power of initiative, courage to change and courage to create new things, spirit of co-operation and a capacity for organization.

"Reasonable scope for the co-operative effort of the people is provided for, however imperfectly it may be at present, by the organization known as the Economic Conference; and no one who has witnessed the educational activities, the roar of industry and the keen competition in trade, that is going

on in the advanced countries of the West, can fail to sympathize and co-operate with the objects of this movement.

"The organization is intended to stimulate co-operative enterprise in cities and towns and gradually among the rural population, but since nine-tenths of the people still live in villages, it appears to me that a special effort is necessary to stimulate economic activity in rural areas

"The village forms a convenient unit for purposes of economic effort, for taking stock of progress at the beginning and end of the year. If each village shows a little improvement, from year to year, the collective result will be large. No village should be considered as maintaining a fair standard of enlightenment which does not keep 5 to 10 per cent. of its population under education. No village should fail to subscribe to one or two well-conducted vernacular newspapers to keep itself informed of what is going on in the outside world. Every village family should be induced to keep in reserve grain or money sufficient to tide over a famine for two years. No cultivator's family should be without a subsidiary occupation to provide the members with the means of livelihood when agricultural operations are slack, or are stopped during scarcity or famine. Every village should show some public improvement or other as the result of the collective effort of its inhabitants at the end of each year.

"The villages may be called upon to publish once a year a few essential statistics of their economic growth"

Every effort was made during the six years of my service as Dewan to promote developments on a plan with specific standards to be worked up to or to be attained in each case. Though top priority was given to education and industries, no aspect of national life and activity was neglected but attention was devoted to each to the extent that the resources available permitted.

Unfortunately the First World War broke out in August 1914, some 21 months after my assumption of office, and it continued till nearly the end of my Dewanship in December 1918.

His Highness the Maharaja placed his troops and the entire resources of the State unreservedly at the disposal of the Imperial Government. His Highness also contributed a sum of Rs 50

lakhs towards the cost of the Indian Expeditionary Force which was fighting the Empire's battle on the Continent.

In conveying this offer in a letter, dated 20th August 1914, to His Excellency the Viceroy, His Highness added.

"I desire to assure Your Excellency, in all sincerity, of the devotion and loyalty of my people and our readiness to make every sacrifice to protect our common interests."

His Excellency the Viceroy concluded a highly appreciative reply in these words.

"For the moment, I will only add that the thought that you, my friend, have shown such splendid patriotism at a time like this fills my heart with a warm glow of pleasure"

The effect of the war, however, was that many important developments, particularly in the field of industries, were retarded or arrested. Some of the information noted in subsequent chapters will show what was attempted or achieved in the face of the limitations imposed by war conditions

The foregoing extracts are somewhat long but they seem necessary to give a correct view of the difficult conditions under which the administration was being carried on and reforms and developments were attempted while the war lasted.

EARLY REFORMS—POLITICAL AND ADMINISTRATIVE

WHEN the State was handed over to the rule of His Highness Maharaja Chamaraja Wadiyar Bahadur in 1881, the Rendition was effected by what is known as an *Instrument of Transfer*. The feeling of His Highness Maharaja Krishnaraja Wadiyar Bahadur and the subjects of the State was that the relations with the Paramount Power should be regulated by a proper treaty, as was the case between the Government of India and the other more important Indian States. This matter had remained unsettled for a long time His Highness the Maharaja was anxious to see that the State's future relations were regulated by a treaty.

When Mr Edwin Montagu was Under-Secretary of State in 1913 he visited Mysore to study the question and went back with a definite understanding that a treaty embodying suitable terms would be concluded. The final drafting of the Treaty was done later at Karapur when Lord Hardinge, the Viceroy, was on a visit to the Elephant Kheddas His Highness the Maharaja was also present there. After discussion between Lord Hardinge, His Highness the Maharaja, Sir Hugh Daly the British Resident and myself, the final draft of the Treaty as it exists today was accepted and sanctioned

The Instrument of Transfer, defining the conditions subject to which His Highness the Maharaja was entrusted with power, was in the nature of a unilateral imposition of conditions. The Treaty, however, contained terms agreed upon between His Highness the Maharaja and the Paramount Power. It gave full powers of internal administration in the State to His Highness, subject only to the general supremacy and paramountcy of the British Government. The net result was an increase in the powers and status of His Highness the Maharaja. He thereafter ruled the State on the basis of a treaty mutually agreed upon which assured for him greater autonomy and powers of internal administration.

The changes effected by the Treaty need not be gone into in detail as they are only of academic interest now in view of the

revolutionary changes that have taken place in the relations of Indian States to the Centre with the transformation of the Government of India into an independent Republic. The States are now, for all political purposes, closely integrated with the Centre and though they are units of the Federation, they occupy, in actual working, a lower subordinate position than what they held under the British administration. It is hoped this is only a passing phase in the evolution of the new democracy.

In a speech he made on 6th November 1913 at Mysore, the Viceroy, Lord Hardinge, referred to the Treaty in these words :

"I have now the pleasant duty of making an announcement, which it is as gratifying to me to deliver, as I trust it will be to Your Highness to receive. Some four months ago Your Highness wrote to me a letter in which you took exception to certain features in the Instrument of Transfer of 1881, under which the Government of Mysore was restored to Your Highness' father, and you urged that the document should be revised both in substance and in form, in such a manner as to indicate more appropriately the relation subsisting between the British Government and the State of Mysore. After a very careful consideration of the question, I have decided, with the concurrence of His Majesty's Secretary of State for India, to substitute for the Instrument of Transfer a new Treaty which will place the relations between us on a footing more in consonance with Your Highness' actual position among the Feudatory Chiefs in India. His Majesty's Government, in accepting my proposal, have observed that Your Highness' views on this question were stated with much force and moderation and that they derive additional weight from the high character and reputation which Your Highness has always borne. With this observation I desire to associate myself in the very fullest degree, and I look on it as a particularly happy circumstance, that it should have fallen to my lot to convey to Your Highness on this auspicious occasion so striking a proof of the esteem and regard in which you are held by those responsible for the Government of this great Empire."

His Highness the Maharaja was gratified by the change and in a personal letter to me, dated 22nd November 1913, made the

following generous reference to the small part I had taken in the evolution of the new Treaty.

"I take this opportunity after the conclusion of the Viceroy's visit, of expressing to you my sincere gratitude for all that you did in connection with the Instrument of Transfer. I fully realize the fact that the success of my representation to the Viceroy was in no small measure due to the able and convincing manner in which you put the case before him, and I cannot sufficiently thank you for the great service you have thus rendered to me and my State and which I shall always remember with feelings of deep gratitude

"It is a source of great pleasure to me that within a short period of four years or so that you have been here, you should have won not only this lasting honour for Mysore, but accomplished so much for the State in several other directions I can only ask you to believe that I am deeply sensible of all you have done and are doing for my State, and I can assure you—if indeed an assurance is needed—that my sympathy and assistance will not be wanting"

Reforms in the Representative Assembly

The Representative Assembly was brought into existence in 1881, during the reign of His Highness Sri Chamaraja Wadiyar Bahadur and the period of office as Dewan of that far-sighted and patriotic statesman, Mr C Rangacharlu. The power of the Assembly was limited to making representations to Government as a petitioning body. Up to the time I took over office, the powers of the Assembly had not made any appreciable advance

In accordance with modern democratic tendencies, it was thought desirable to give the Assembly some real powers. With the approval of His Highness the Maharaja this question was referred to by me in the first Assembly meeting which I was privileged to address on the 11th October 1913, in the following terms:

"It may be advantageous, at this session, to consider questions pertaining to the composition of the Assembly, the methods of electing members thereto, its functions and the system of transacting business. If the members discuss these questions and make known their views, the same will be submitted to His Highness for his gracious consideration."

In the decisions that followed, the Assembly was given the privilege of discussing the State Budget. For this purpose, an Abstract Budget prepared in Kannada, the language of Mysore, was printed and circulated to members.

At the same time there was only one session of the Assembly during Dasara in the months of September and October and the Budget was therefore discussed after it had been sanctioned and had come into operation. To give the members an opportunity of discussing the Budget before it was passed, an auxiliary or second session of the Assembly was sanctioned. The first such session was held on 23rd April 1917. The Assembly was also given the privilege of interpellation and the right to elect four members to the Legislative Council instead of only two. Towards the end of the term of my office, the franchise of the Assembly was further broadened by lowering the qualifications for membership and voting.

Reforms in the Legislative Council

As stated before, the Legislative Council was started in 1907 when Mr. V. P. Madhava Rao was Dewan. It consisted of 15 to 18 nominated members, official and non-official, of whom only two were elected by the Representative Assembly. Its main functions were to frame, discuss and approve the legislative measures required by the State.

Several reforms were effected in the composition of this body and its powers. The strength of the Council was raised from 18 to 24. Of these, four were to be nominated on the recommendation of the Representative Assembly, four by territorial constituencies comprising the districts, ten were to be officials and six nominated members. The number of elected representatives was raised from two to eight.

The powers of the Council were increased; they were given the privilege of Budget discussion and interpellations with certain specific limitations in the early stages. Later on the number of interpellations allowed was increased and the right to put supplementary questions was granted.

Viewed from present-day developments these reforms may seem unimportant, but as they marked a definite advance over the

previous position, they were highly prized at the time they were sanctioned.

Developments in Administration

Separation of the judicial and executive functions was one of the developments taken up. There was a long controversy in British India on this subject but the separation was regarded as a measure essential to the people's liberty. The necessary arrangements for bringing this system into force into two districts as a first step were made during my term of office but the actual operation began on 1st January 1919, a few weeks after my retirement.

The essential features of the scheme were that Revenue Officers were divested of their judicial functions which were transferred to a separate magistracy as a special branch of the judiciary to be constituted for the purpose. Revenue Sub-Divisional Officers and Amildars were not allowed to deal with criminal cases but were ex-officio Magistrates for the purpose of exercising powers connected with the maintenance of peace. Deputy Commissioners, however, continued to be District Magistrates.

Two committees were set up to consider the question of the constitution and functions of local self-government bodies and the improvement of their financial resources. The subject was considered and necessary legislation was passed to put through a scheme of reorganization. The objects of the scheme were "to strengthen the elective elements in municipal and local boards, to enlarge their powers and functions, to increase their financial resources and to render them real, responsible and capable agents in the administration of their own local affairs."

The Municipalities in the State were classified into three categories, City, Town and Minor, on the basis of population, with an elected element of not less than two-thirds in city, half in town and one-third in minor municipalities. Presidents in selected Municipalities and Vice-Presidents in a larger number of the same were also to be elected. The city of Bangalore was given the right to elect its own President.

The elected element in the District Boards was to be at least two-thirds of the total members while in the Taluk Boards and Unions, it was to be not less than half. Each of these Boards was given a real corporate existence with independent funds and

budget. The powers of the Rural Boards in regard to establishment and budget were also increased and they were given control over primary education, medical relief, and veterinary dispensaries in their area.

Deputy Commissioners were relieved of the ex-officio Presidentship of the District Boards and non-officials were appointed instead wherever feasible

In the new scheme the village was made an important factor and an attempt was thus made to remove the reproach that our local institutions were built from the top. It was also proposed gradually to develop the District Boards so that they may participate in the general administration of the district and occupy, in course of time, a position analogous to that of the District Councils in England and other countries

The Mysore Economic Conference

The Economic Conference with its three Committees on Agriculture, Industries and Commerce, and Education, which had begun working during my term of office as Chief Engineer, was further developed. A full-time officer was appointed as Secretary to Government in order to associate and co-ordinate the work of the Committees of the Conference with the departments of the Government concerned

A survey of the economic resources of the State was carried out by an officer appointed for the purpose and a comprehensive and useful report was published thereon.

As the work connected with the Economic Conference expanded, Superintendents were appointed for each district to help the Deputy Commissioners and District Committees in the work of spreading information, stimulating local enterprise and helping people in organizing practical schemes and co-ordinating the activities of the Central and District Committees. Handbooks of Economic Report were published on the conditions and needs of each of the eight districts of the State.

Annual sessions of the Conference were held at which the Dewan presided. At these conferences, all activities connected with the work achieved were reviewed and plans laid out for work for the following year.

The Committees of the Conference dealt with a large number of questions falling within their sphere and formulated schemes of economic development

Among the more important developments considered by the Committees were proposals for the Bank of Mysore, the Mysore University, expansion of primary education, introduction of compulsory education and a number of individual cultural and industrial schemes, including the Kannada Literary Academy meant to promote the creation of Kannada literature on science, and other subjects of modern practical value.

As stated in my address to the Representative Assembly in October 1918, His Highness the Maharaja was pleased to decide that the Economic Conference should be made a permanent institution

Efficiency Audit

A system of "Efficiency Audit" was introduced with a view to take the continuous action necessary for preservation of discipline and efficiency in Government Departments and service personnel. The reason for audit was given in my address to the Representative Assembly in October 1913 in these words.

"In a country like ours where the system of Government departments is maintained on the European model and the staff employed to work them have not fully adopted European business habits, an 'Efficiency Audit' is as much a necessity as a 'Financial Audit'."

The "Efficiency Audit" Branch, which was attached to the Secretariat, did useful service in systematising work in Government offices and departments, in compiling rules and standing orders for various offices and in drawing up a comprehensive scheme for the issue and speedy preparation of Departmental and Office Manuals and for keeping them revised and up to date. It made some progress in standardising inspections and preparing rules for maintaining proper records in offices. The officers of the branch were further employed in investigating any serious irregularities that came to the notice of the Government. The Efficiency Audit Branch also undertook the publication of a *Quarterly Blue Book Journal* containing important Government orders and furnishing information on matters of departmental technique likely

to be of use to officers in the day-to-day discharge of their duties.

During all this time His Highness the Maharaja showed unstinted appreciation whenever he noticed any good work done by his Government. In a personal letter to me dated 24th July 1914, he wrote

“I do not mind telling you, but it is a fact that I have never before since 1902 enjoyed so much peace and happiness as I have during the past 21 months, thanks to your able management of affairs, and I trust that it may long continue”

DEVELOPMENTS IN EDUCATION—MYSORE UNIVERSITY

ACCORDING to my addresses to the Representative Assembly, the principal needs of the country, broadly stated from the Government standpoint, fell under three main heads.

- (1) Increasing production and raising the standard of earning and living among the people;
- (2) Extending education and enlightenment among all classes of the population; and,
- (3) Training the people and encouraging self-help, co-operative effort, initiative and enterprise among them

As stated by me in the Representative Assembly on the 22nd April 1918, the foregoing three main objects were steadily pursued on the whole with gratifying results

Of the two developments on which I had long laid stress, *viz.*, industries and education, increase in education received top priority. On account of the war, industries did not receive proper support from the Central Government or from business men in Mysore or from manufacturers in foreign countries whose co-operation was needed.

I had been impressed in my previous travels abroad with the importance which the Western nations attached to education. I was convinced that the unsatisfactory economic condition in Mysore was due chiefly to neglect of education. My travels in Japan towards the closing years of the nineteenth century had created a deep impression on me in this respect. The Japanese leaders had found out the secret that education was the basis of all progress. The object which the Japanese Education Department had steadily kept in view was the training of the native mind to European ways of thinking and working. One of the very first acts in this direction in Japan was the issue of a Code of Education, the object of which was thus explained to the nation by the express command of His Majesty the Mikado

"All knowledge from that necessary for daily life to that higher knowledge necessary to prepare officers, farmers,

merchants, artisans, physicians, etc., for their respective vocations is acquired by learning. It is intended that henceforth education shall be so diffused that there may not be a village with an ignorant family nor a family with an ignorant member."

In 1877, the Tokyo Imperial University was established and several foreign language schools were started to qualify people for commerce and other practical pursuits.

The Code of Education was frequently revised and in one such revision the principles kept in view were explained to be "the cultivation of the moral character, the development of the spirit of loyalty and patriotism, and the acquisition of knowledge necessary for practical occupations"

Military drill was encouraged in the various schools with a view to develop discipline and other healthy traits of character. Children were kept most cheerful and instructed in loyalty, patriotism, behaviour, morals and human relations

One of the points to which my attention was drawn was the progress that had been made in the education of women up to about the year 1900. I noticed there were in Japan about 1.5 million girls at school while in India the number was only 400,000, notwithstanding the vastly greater population in our country.

At that time, that is, during my first visit to Japan in 1898, I was assured by the Professors in Tokyo and Kyoto that university students were not required to purchase their books; most of them could not afford the expense. The Professors gave notes to the students; the latter also picked up information from books in the library. I noticed that the training which was imparted in the universities was highly practical and so great was the demand for university men that appointments, private or Government, awaited them as soon as they passed out.

The university Professors in Japan led simple lives and laboured from patriotic motives. Although men of their qualifications could earn much more in private employment than they received from Government, with them it was a case of high thinking and plain living. Their working dress out of doors was modern and European, and in everything else in home life except business they were Japanese. The habits followed were in many cases traditional

In a speech before the Mysore Economic Conference on 11th July 1913, the following observations were made by me in regard to the circumstances of education in Mysore at the time:

"Taking education first, out of 57 lakhs of people in Mysore, only $3\frac{1}{2}$ lakhs can read and write, that is, only six persons out of every 100. The corresponding ratio in advanced countries is 85 to 95 persons in every 100.

"In the United States of America, the expenditure incurred on education amounts to about Rs 14 per head of population; in Mysore, it is less than six annas per head.

"In the most progressive countries again, nearly one-fifth of the total population are at school. The proportion in Mysore is nearer one-fiftieth.

"Although we have a population of nearly six millions, we have no universities in Mysore. In Canada, with a population scarcely 25 per cent more than in Mysore, there are 20 universities; in the United Kingdom, there are 20 universities for a population of 45 millions and in Germany 21 universities for a population of 65 millions.

"Formerly, only 5 to 10 per cent. of the population in every country received what may be termed liberal education. It was then not considered necessary to give any training to persons engaged in agriculture, industries or manual labour. But the civilized countries have now discovered that education was of great advantage for all manual occupations and industries and that the higher the standard of education and science applied to industrial callings, the greater was the wealth produced."

Elementary Education

In the field of elementary education, a vigorous drive was launched to increase the number of schools, both Government and private, and to introduce a system of grants and subsidies to encourage school buildings. This roused some enthusiasm among the rural population. Once as I was passing on the main road by the side of a village known as Beldara, the people of that village threw a bag of rupees into my car as their part of the cost of their school building and complained to me that though they had their share ready the Government department had delayed sanction to the construction of their school building.

Special grants were made for the education of backward classes and depressed communities, now known as Harijans. The standard aimed at was to double the school-going population in five years.

Legislation was passed introducing compulsory primary education. It was introduced, in the first instance, in selected areas and extended as time went on. In June 1918 it was in active operation in 68 centres and preliminaries had been completed to extend it to 170 centres more.

As a result of these and other measures, the number of public and private institutions in the State rose from 4,568 in 1911-12 to 11,294 in 1917-18. The number of children attending school rose in the same period from 138,153 in 1910-11 to 366,856 in 1917-18 or nearly 2.6 times.

The education of girls also received special attention and encouragement. The percentage of girls at school to female population of school-going age rose from 6.4 in 1912-13 to 14.2 in 1917-18.

Additional schools for girls, both primary and secondary, were opened. The Maharani's College in Mysore was raised to a first grade college with the addition of Bachelor of Arts courses in 1917. The first hostel for women students was opened in Mysore in 1914.

Engineering and Technical Education

An Agricultural School was opened in Bangalore in the year 1913. The course in the school was arranged to be as practical as possible. Provision was made for short courses in Kannada for the benefit of small farmers.

A Mechanical Engineering School and a Commercial School were established at Bangalore. The Engineering School and the Industrial School then existing at Mysore were combined to form the nucleus of the new Chamarajendra Technical Institute which was located in a spacious building in Mysore City specially constructed for the purpose. There were also commercial courses in this new institute.

The Commercial School at Bangalore provided for an elementary course in commercial subjects in English and Kannada for one year and a secondary course in English for two years.

Special courses were given in Kannada for small shopkeepers in elementary account-keeping, banking and commercial geography.

Industrial Schools were opened in all District Headquarters Commercial classes were also opened in certain high schools

The next development in technical education was the establishment of the College of Engineering in Bangalore. This step was taken because the responsible authorities both at Madras and the Government of India were opposed to admitting to the Engineering Colleges in Madras and Poona more than five students a year from Mysore which we considered wholly insufficient for the needs of the State.

A large number of foreign scholarships was sanctioned to enable students to proceed abroad to equip themselves with higher education.

The University of Mysore

The question of establishing a university engaged the attention of the Government ever since I took up office as Dewan

Two Educational Officers were deputed in succession to England, America, Japan and Australia, and both of them submitted useful reports which were placed before the public. Dr. C. R. Reddy, the present Pro-Chancellor, was one of them and Mr. Thomas Denham the other.

A committee, consisting of members of Government and the leading Educational Officers of the State, commenced the investigation of the university question in July 1914. It held meetings at intervals for about six months. Rough proposals were prepared by the Committee and they were placed before the Government of India with a brief memorandum in July 1915. The Political and Educational Officers of the Government of India interested themselves in these proposals and discussed them with Sir Hugh Daly, the then Resident, and myself. Shortly after the meeting, the Hon'ble Mr. Sharp, Educational Commissioner with the Government of India, furnished the Mysore Government with an important note criticising, and suggesting various improvements in, our scheme. The Government took full advantage of the suggestions and revised their proposals. The revised scheme was submitted for the consideration of the Government of India in February 1916.

Later in the same month, Sir Hugh Daly and myself had occasion to meet and discuss the matter with the Educational Officers of the Government of India who proved to be friendly and gave the matter their sympathetic consideration

As the academic year usually began on 1st July, His Highness' Government were anxious to start work on the new university from that date. If we did not do so, we would have lost another full year. We, therefore, in March 1916, appealed to the Government of India to permit us to start the University from the 1st July following. Permission was given subject to certain conditions respecting the adjustment of our future relations in this matter with the Madras University. Till then, the educational institutions in Mysore trained students for graduation in the Madras University.

Through the courtesy of the Chancellor of the Madras University, Lord Ampthill, a meeting was held at Ootacamund in June 1916 for exchange of views between the members of the Syndicate of the Madras University and the Hon'ble the Resident in Mysore and myself.

The representatives of the Madras University Syndicate were opposed to our setting up a separate university. When we pleaded that a mother should welcome the efforts of a grown-up daughter to set up a house of her own, the reply was that they did not see any obligation on their part to encourage a runaway daughter. Eventually the differences were smoothened and adjusted and the new university began its career from 1st July 1916.

It was decided to locate the University in Mysore City on a site considered an ideal one for the purpose. In piloting the University Bill before the Legislative Council at the time, I remarked:

"I have had the privilege of visiting numerous universities in England, on the Continent as well as in America and Canada. The great majority of them are situated in populated areas. I do not believe in segregating the students and allowing them to grow up as it were in a cloistered life. They will be at a disadvantage when they come back to the hard realities of this work-a-day world. The aim of the university should be rather to train the character of the students under

conditions not entirely different from those which they will have to encounter in later life"

A university, I added, may be said to have a general object and certain specific aims depending on the state of the country's civilization and of its material prosperity. The general object in the broadest sense is to encourage learning, to promote higher education, to create a centre of culture, to light a torch that would dispel the gloom of ignorance from the remotest corners of the country. The specific aims in Mysore should be to develop the intellectual ability and executive power of our citizens and to afford the training necessary to prepare future manufacturers, merchants, business men, economists, lawyers, sanitary experts, engineers, statesmen, etc., for the work of the country.

The University, as stated above, was started from 1st July 1916 and the first Convocation for conferring degrees was held on 19th October 1918 at Mysore. His Highness the Maharaja, the Chancellor, presided, and the distinguished educationist and scholar, Sir Asutosh Mookerjee of Calcutta, delivered the Convocation address. In his speech on the occasion, His Highness the Maharaja referred in the following gracious terms to the circumstances of the establishment of the University:

"I feel that I should acknowledge on this public occasion a debt of gratitude from myself and my people to Sri M. Visvesvaraya, the Dewan of my State. It is chiefly his patriotism, his enthusiasm, and his unflinching advocacy which converted what was once little more than a dream of the future into a living creation, and his name will always be remembered, above all others, as the man to whom our University owes its being."

No Indian State in those days had a university. This was the first attempt in that direction and at the time the attempt was made nobody believed that it could be realized in the conditions then existing. Happily, through the unwavering support of His Highness the Maharaja and the enlightened policy of the Government of India under Lord Hardinge, the university idea became an accomplished fact.

Chapter X

PUBLIC IMPROVEMENTS ATTEMPTED IN MYSORE

I HAVE referred to the more important educational, political and administrative improvements and developments which were effected during my term of office as Dewan. It will be remembered that when I entered the Mysore service as Chief Engineer in November 1909, I had stipulated that besides Public Works I should be given opportunities for attempting developments in the State, particularly in the fields of education and industry. For a second time I specifically brought to His Highness the Maharaja's notice that routine administration did not interest me, my travels and studies in Europe, Japan and America had filled my mind with the great possibilities of progress and prosperity which lay before our country and I thought it was unworthy of a civilized community to sit still with so much ignorance and such low standards of living all round us, and avoid active effort to promote the country's uplift.

A brief reference may not be out of place to a few of the other more important developments which received attention.

Over 85 per cent. of the population was uneducated and the holdings were of small size. These defects precluded the possibility of achieving any rapid progress in production under agriculture. Nevertheless, a few measures mentioned below were adopted.

Establishment of Government farms, demonstration of improved methods of cultivation, use of improved agricultural implements, distribution of manures and of improved seed strains, short courses of training in the Agricultural School at Hebbal and other centres and more liberal grants of Takavi loans. Attempts were also made to collect agricultural statistics.

There was a large number of tanks, mostly of small size, which had to be kept in repair. It was difficult to induce the population to work for their maintenance themselves and keep them in proper repair. I tried to introduce the Block System of irrigation under the Marikanave Reservoir, as already stated, as well as under the Cauvery left bank canal. Some good was done but it was

difficult to induce the illiterate population to realize that heavy waterings did not do crops much good. It is feared the discipline and rules necessary for working a proper system of irrigation are still imperfectly observed. Even in the Cauvery Valley too much water is used on the crops to their detriment. The villagers do not like restrictions; the civilian officers, in some cases, sided with them and unwittingly allowed wasteful use of canal water. It is hoped the necessary rules and discipline will be revised with changing circumstances and strictly enforced on irrigation works in future.

Industries

In modern life industries are the mainstay of the progress and prosperity of a nation. In my time the following industries and manufactures were introduced in Mysore.

- Development of sericulture

- Sandalwood oil manufacture

- Manufacture of soap

- Metal factory

- Chrome tanning factory

- Establishment of central industrial workshop and district workshops

- Granting subsidies to encourage small and village industries

- Encouragement to new cottage industries

- Establishment of hotels and printing presses

- Encouragement to start private workshops by granting loans, etc

The Mysore Iron and Wood Distillation Works, to which detailed reference will be made later, were sanctioned and construction started in 1918. This important work was under investigation and consideration for nearly four years before it was actually sanctioned. The scheme was prepared with the help of Mr C. P. Perin, the same American Consulting Engineer and Expert who designed the Tata Iron and Steel Works at Jamshedpur.

It being war-time between 1914 and the date on which I laid down office in December 1918, the Government of India were opposed to the establishment of new industries or factories of a mechanical engineering character. They stated that all skilled

labour was wanted for arms and ammunition work. In these circumstances, we contented ourselves with surveys and preparation of projects and proposals for several new industries like steel, paper, sugar and cement, in expectation of being able to start construction as soon as the war ended.

On account of the war, again, there was not much scope for export trade. Nevertheless we prepared estimates of export and import products which were considered of practical value. A College of Commerce was brought into existence. Haji Sir Ismail Sait, an enterprising merchant living in the Civil and Military Station of Bangalore, gave a donation which enabled the Chamber of Commerce to start the construction of a building of its own. For the common trader, evening classes in commercial subjects were held in Bangalore as well as in some Taluk headquarters. The University Degree course in Commerce (B Com) was, however, abolished after I left service. But some three years ago the Government were induced to restart the course.

A deputation of business men and merchants was sent to Japan in 1917 to study the system and practices of trade followed in that progressive Asiatic country and, wherever possible and suitable, to adapt them for developing the trade of Mysore.

Growth of Hydro-electric Power

It has already been stated that the actual power generated at Sivasamudram was 13,000 h.p. and this was increased by the partial construction of the Cauvery Reservoir so as to yield 25,000 h.p. to meet the additional demands of the Kolar Gold Fields. This increase was effected by stages.

At the present time the total power generated with the aid of stored water is stated to be 83,000 h.p. The power revenue of Government has increased from Rs. 16.65 lakhs in 1911-12 to Rs. 24.2 lakhs in 1918-19 and to Rs. 1.33 crores in 1948-49, the latest complete year for which figures are available.

The two American engineers who worked on, and helped to develop, the Hydro-electric Scheme were Mr. H. P. Gibbs and Mr. S. G. Forbes, both of whom rendered efficient service in Mysore and subsequently joined Messrs. Tata Sons, Ltd., Bombay.

A project for the development of power at the Jog Falls on the Sharavati River in the Shimoga District was taken up and surveys

were in progress. Insufficiency of resources in men and money, particularly during the war, precluded the State from taking up the construction of this important and attractive hydro-electric scheme during my term of office. It is satisfactory to find that the actual construction of the scheme has made good progress. The power now generated is 48,000 kw. and the estimated amount when the present design is completed will be 120,000 kw.

Railway Extension

After I succeeded to the office of Dewan, the construction of additional railway lines which had been stopped was taken up. An office of Chief Engineer for Railway Construction Works was established and the services of Mr. (later Sir) E A S Bell were obtained from the Government of India. A local Railway Department was organized and local engineers and other officers were recruited for training and service. Arrangements were made with the Government of India for taking over the working of the Mysore-Bangalore and other branch lines from the M. & S M. Railway. In a personal letter to me dated the 10th April 1918, His Highness the Maharaja stated :

"I was delighted to learn from your letter received this morning that the Government of India had passed orders *re*. transferring the Birur-Shimoga, Mysore-Nanjangud, the Bangalore-Mysore lines to State management—a real gain to the State on which I congratulate you."

The railway mileage in the State, which was 411, had risen to 616, and 46 miles were under construction when I retired from the State service. The present mileage in the year 1950 is 757. A new Railway Department was organized with necessary trained personnel and brought into working order.

The gross revenue from railways in 1912-13 when I assumed office as Dewan was Rs. 37,21,674; in 1918-19, when I retired, it was Rs. 53,00,806 and it stood at Rs. 248 crores in 1948-49.

The Mysore Railways were not connected with the metre-gauge railway system in the south probably because the British companies who operated the South Indian and M & S M Railways were opposed to the proposal. On more than one occasion I urged this connection but the Government of India would not agree.

A Port for Mysore

Investigations were started for a harbour scheme at Bhatkal, which is conveniently situated for the foreign trade of Mysore. From an engineering point of view I found that Mangalore was not conveniently situated. It is hoped that the final decision, whenever taken by the Government of India, will be in the interests of the largest population of the country. Bhatkal will serve parts of the States of Madras, Bombay and Mysore. The interests of Mysore will be best served by a port at this site. The necessary investigations and surveys for the harbour and the railway to connect it with Shimoga were nearing completion in 1918 when I retired from office.

Improvements in Administration

Rules were framed for recruitment to services. In addition to the Mysore Civil Service Examination which was held regularly under revised rules, competitive examinations for officer grades were instituted in a number of other departments. The principle of proper qualification for subordinate service was generally recognized and enforced. In recruitment to services, a certain number of vacancies was reserved for representatives of the backward classes.

Another important reform was the establishment of District and Taluk Conferences for discussion of local problems by representatives of the local agricultural and other interests.

Towards the end of my service I endeavoured to introduce a definite code of principles and policies to be followed in the Administration and Services. Too close adherence to Western practices was not popular and it was not possible to see the Code of Rules completed and brought into operation before my retirement from service, as was intended.

Finance and Revenue

The gross revenue of the State in 1911-12 was Rs. 2.51 crores and in 1919-20 Rs. 3.1 crores.

Many changes have occurred in the finances of the State and the revenue for the latest complete year 1948-49 was Rs. 11.84 crores.

In a statement issued by me in 1928-29, detailed figures were given to show that in every one of the years I was Dewan there

was a surplus, and capital to the extent of Rs 332 lakhs had been invested on industries and productive public works which were assets to the State. This statement was issued by me about ten years after my retirement from the service of the State as I found that the financial position of my period of office had not been correctly understood notwithstanding the fact that the Budget for 1919-20, which was introduced in the Legislative Council a few months after I laid down office, was referred to by the then Dewan as a "Prosperity Budget."

City and Town Improvements

Some improvements in the cities of Bangalore and Mysore were also carried out. Mysore City was developed for the most part under the personal supervision of His Highness the late Maharaja Sri Krishnaraja Wadiyar Bahadur. The town planning of both the cities was under constant consideration. These were further developed in the times of my successors in the office of Dewan, particularly of Sir Mirza M. Ismail, who enjoyed a long term of office and took special interest in town-planning schemes and in the improvement of the two major cities and other towns in the State.

A modern drainage project was prepared by me for Mysore while I was Chief Engineer of the State and was subsequently carried out.

Through the exertions of several Dewans, Sir K. Seshadri Iyer, Mr. V. P. Madhava Rao and Sir Mirza M. Ismail the two cities of Bangalore and Mysore have been improved. Their general plan is based, to some extent, on modern town-planning systems. Their layout and maintenance are probably not equalled by any other large city in India.

Rural Development

The principal developments in this field were the introduction and operation of a Village Improvement Scheme which provided for local *Panchayats* to maintain villages in a sanitary condition. The rural population was also encouraged by grants and propaganda to lay out roads for connection with neighbouring villages and to effect other improvements within the villages themselves. The measures adopted roused public interest and

encouraged, to some extent, the villagers themselves to keep the villages clean and improve road communications with neighbouring towns and villages.

At present 460 towns and villages in the Cauvery Valley are supplied with electric power and lighting Rural industries are also encouraged.

A new development, called the Malnad Improvement Scheme, was started, the object of which was to improve the Malnad tracts by reducing malaria and increasing the productive and earning power of the people. A printed pamphlet of over 100 pages was issued by Government in 1917 which gave particulars of the work done and preparations made for further development at that time.

Attempts for Social Advance

There was scope for development in many directions but the resources were limited and ambition was lacking, particularly in the rural population.

One of the principal steps taken was to keep temples and places of worship clean and tidy Arrangements were made for regular supervision by a Government staff

A beginning was made to develop hill-stations, commencing with the Nandi Hill, about 3½ miles from Bangalore. It was also intended to develop several other hill-stations like Kalhatgiri and Devarayandrug which were being used as hill-stations by officers during the British regime. Nandi was further developed into a popular hill-station by improving the accommodation, amenities and facilities for visitors

New Guest Houses were constructed in Mysore City. The establishment of a modern Hindu hotel at Bangalore was encouraged by the grant of a small subsidy and at Mysore a new building for a modern Hindu hotel was constructed.

Two clubs on the English model were started in Bangalore, viz., the Century Club in Cubbon Park and a Ladies' Club next to Carlton House. The Cosmopolitan Club in Mysore was helped by the grant of a building site.

A Civic and Social Conference was established and the first committee came into being with the late Sir K. P. Puttanna Chetty as Chairman.

General

No modern institutions or services which prevailed in advanced countries were ignored. But developments were limited by the paucity of resources in men and money.

I have merely given a rough list of developments of a progressive character attempted in my time, and credit is really due to the many people—Government officers and leading public men—who co-operated with me at the time. The aim in all the above activities was to lay a firm foundation for future progress and to introduce a civilized life of the modern type among our people.

I should in this connection pay my tribute of respect to the memory of His Highness Sir Sri Krishnaraja Wadiyar Bahadur. He was a noble and patriotic ruler, loved by his subjects for his high character and his single-minded devotion to the welfare and advancement of his State. He extended unvarying support and encouragement to every development which aimed at promoting the welfare of his subjects.

Though towards the end of the term of my office there was some difference of opinion in official matters, specially in regard to the pace of developments and policies to be pursued, our relations remained very cordial throughout. In a letter dated 24th May 1917 from Ootacamund, His Highness the Maharaja was pleased to write me.

"In regard to the recent incidents which you referred to, I have done my best personally to explain my views to you and I hope that on consideration you will find that our differences of opinion on official matters are not irreconcilable. I can, however, reassure you that no official differences can affect my personal regard for you and my recognition of the great services you have rendered to my State."

Chapter XI

LATER DEVELOPMENTS : VOLUNTARY RETIREMENT FROM OFFICE

Discussion on Constitutional Reforms

POLITICAL reforms and questions pertaining to the future Indian Constitution were under active consideration and discussion in British India about the year 1917-18. The political fortunes of the Indian States were also involved in these discussions. Mr. E. S. Montagu, who had succeeded Lord Morley as Secretary of State, was on a visit to India in 1917-18. In Mysore we had formed a committee to consider the future relations of the State with the Central Government. His Highness the Maharaja himself presided at one of the meetings and His Highness the Yuvaraja of Mysore, who was a member of the Government at the time, also attended.

At a later stage Lord Chelmsford, the Viceroy, and Mr. E. S. Montagu visited Madras to elicit the views of leading officials and Indian leaders in this part of the country. I attended a meeting on that occasion and later was accorded a personal interview by Lord Chelmsford and Mr. Montagu. The following reference is made to my visit by Mr. Edwin S. Montagu in his publication, "An Indian Diary".

"They (some other visitors) were followed by the Dewan of Mysore, who came to speak to me about the Cauvery Arbitration, and also about his desire to associate Princes with the Second Chamber. He is quite right. Chelmsford objected but I am sure Chelmsford is wrong"

It may be mentioned, in passing, that in their Report on the Indian Constitutional Reforms, Lord Chelmsford and Mr. Montagu recommended the creation of a Council of Princes as a permanent consultative body with provision for joint deliberation in matters of common interest between the Council of Princes and the Council of State.

I may state here that His Highness the Maharaja of Bikaner, Sir Ganga Singh Bahadur, had visited the Mysore State previously

and had closely gone into the system of administration in this State. He subsequently wrote a letter to me from Bikaner under date 8th January 1916 in which he stated

"It was a great pleasure to me to have visited your fine State and to find that both in name and reality the State and its Government are model ones. His Highness, you, and other officers of your Government are, if I may say so, doing really excellent work, not only for the State but also for India. I have learnt many things, and hope further to copy many things also here from your administration."

Mahatma Gandhi visited the Mysore State on several occasions, once during the term of my office and again nine years after I had left the State service. On the latter occasion he made it a point to visit the Mysore Iron Works at Bhadravati and the Krishnarajasagara Reservoir near the city of Mysore as he had heard adverse comments by interested parties on those two works which he could not bring himself to believe. In a speech at a public reception given to him in Mysore City he is reported to have stated.

"The Krishnarajasagara alone which was one of the largest of its kind in the world would perpetuate the name of Sir Visvesvaraya. The other large industrial undertakings on which the State had embarked showed what a march Mysore has stolen over other parts of India and the State's spirit of enterprise." —(*Daily Post*, Bangalore, 21st July 1927)

Voluntary Retirement From Service

About the years 1916-17 there was an agitation in Madras against the Brahmin community in view of the predominant position they enjoyed in Government services. This agitation spread to Mysore also. I was aware that non-Brahmin communities were backward on account of lack of higher education. The education problem had been vigorously attacked ever since I came to Mysore. I had arranged for the Mysore Government granting liberal scholarships to backward communities and depressed classes to encourage their education. Special steps were also taken to advance the prospects of members of backward communities in Government service. It was true that there was considerable inequality in preferment to offices and the Brahmin community

had worked their way to the front. The policy adopted of spreading education rapidly was showing some results. As stated before, the school-going population had been nearly trebled. There was a desire in some quarters to hold back the progressive community by restricting their admission to educational institutions and otherwise reducing their opportunities for acquiring education. With this aim it was impossible to sympathise because it was an attempt to put back a section of the population which by its own special enterprise was going forward.

There was a definite proposal put forward by several leading members of the non-Brahmin community in Mysore to adopt the policy of the non-Brahmin leaders and their Press in Madras. A committee, presided over by Sir Leslie Miller, Chief Judge of Mysore, was appointed by His Highness the Maharaja to consider the question of adopting, in Mysore, measures similar to those advocated by the non-Brahmin leaders in Madras. My idea was that by spreading education rapidly and adopting precision methods in production and industry, the State and its entire population would progress faster. By ignoring merit and capacity I feared production would be hampered and the efficiency of the administration, for which we had been working so hard, would suffer. There was never any complaint that I favoured any particular community in making appointments. Nevertheless, I felt opposed to the establishment of the Miller Committee. His Highness the Maharaja seemed anxious to placate the backward communities and the leaders in the State who supported the policy advocated by the non-Brahmin leaders of Madras. After prolonged discussion and exchange of views for a considerable time, I obtained His Highness' consent to retire from service. Some time was required to arrange and place all new schemes in operation and other contemplated developments in a safe condition before I actually laid down office. So it was agreed, some eight months beforehand, that I should retire at a convenient date at the end of the year. This arrangement was kept a closely guarded secret.

There were at this time under construction two major projects I had started, namely, (1) the Cauvery Reservoir and (2) the Iron Works at Bhadravati. The construction of the Iron Works had just begun and the Cauvery Reservoir (Krishnarajasagara) had been partly constructed. The second stage and the canal works had

not appreciably advanced. The reservoir works had begun to yield a small return but the construction of the Iron Works had only just started. Neither of them had come to a stage in which they had begun to pay.

As regards industries, the actual construction and starting of the Bhadravati Works were greatly impeded on account of the difficulty of obtaining experts and machinery from the time the war broke out in 1914 till I retired in December 1918. My retirement took place just a month after the armistice was concluded.

My relations with the Government of India and their representative were generally pleasant and happy. In a personal letter of the 13th October 1914, Sir Hugh Daly, the Resident in Mysore, wrote to me as follows:

"No better proof could be needed of the entire confidence which the Government of India feel in the position here than the fact that, besides availing themselves of the services of the Mysore Lancers, they have removed almost all the troops from Bangalore and have not even thought it necessary to enquire from me whether they were justified in so doing.

"I merely communicated it to you because you and I have settled to treat each other with the utmost frankness and I like you to know all that I know."

I will now revert to the understanding I had come to with His Highness the Maharaja in April 1918, that I should be permitted to retire from office when I had placed all intricate or new official matters on a smooth working basis for my successor. No new works were initiated in this period. In the nature of things the two big schemes referred to could not be made remunerative at short notice. To lay a firm foundation for future progress several arrangements and measures were necessary and they were attended to as far as possible.

All development work in an Indian State is usually attended with difficulties. Criticisms cannot be avoided. Happily—it may be by accident—all the works for which I was responsible in Mysore for nine years have shaped well and all criticism is now hushed by results which in every important case has risen to expectation.

It may be of some interest at this stage if, in concluding my reference to Mysore affairs, I quote some extracts from the first of

speech I made on 9th December 1918 at a meeting in the Council Hall of the General and Revenue Secretariat, Bangalore, when I formally took leave of Members of Council, Heads of Departments, Secretaries to Government and other staff who had worked very loyally with me.

"I hope it is pardonable for me to claim that so far as the exigencies of the time permitted, there has been no discrepancy between the principles I professed (in a speech I made in the first month of my assumption of office as Dewan, *vide* page 55) and the practice of them. It is occasionally stated in private circles that I am *pro* this or *anti* that community. Time will show that I have tried to hold the scales even, but I am willing to admit that as the chief executive officer responsible for the welfare of the State I have always regarded that my first and principal duty was to safeguard the interests of the Ruler and the people of Mysore.

"I am painfully aware of my failure to have attained my ideals. I am disappointed that much that could have been done has not been accomplished. But I am thankful that the public have been well disposed and no single untoward event or incident has occurred to mar the even tenor of administration these six years. I have found the people of Mysore extremely reasonable and responsive—the vast rural population no less than the accredited public leaders. They have been trustful, I believe not because of any marked successes in the administration, but because they knew Government were sincere and anxious to serve them.

"I also desire to take this opportunity to thank the Press, both European and Indian, for their fairness and generous attitude towards the Mysore Administration in my time.

"I feel I cannot lay down office without giving expression to my profound gratitude to His Highness the Maharaja for all His Highness has been pleased to do for me and all the guidance, support and inspiration I have received from him in my labours for this State."

On the following day, *i.e.*, 10th December 1918, my predecessor in the office of Dewan, Mr. T. Ananda Rao, C.I.E., wrote a feeling letter which I reproduce below:

"I have read with great emotion yesterday's *Gazette Extra-*

ordinary notifying your leave of absence and last evening's *Daily Post* containing your valedictory address delivered at the Secretariat. I am reminded of a passage in Lord Morley's 'Life of Gladstone' which I transcribe here below as being equally applicable to yourself and to the late Mr. W. L. Gladstone

"You do not know how those of us regard you, who feel it a joy to live when a premier believes in righteousness. We believe in no man's infallibility, but it is restful to be sure of one man's integrity."

I proceeded on six months' leave prior to retirement and at the end of that period my retirement was announced in a *Government Gazette Extraordinary* in these terms

" . During all this period Sir M. Visvesvaraya laboured with unwearied zeal and single-minded devotion to increase the material resources of the State. His administration as Dewan has resulted in important and far-reaching developments in education, irrigation works, railway communications and industries, and has laid the foundations for a prosperous and progressive future for the State. Sir M. Visvesvaraya carries with him in his retirement the esteem and best wishes of His Highness the Maharaja and all classes of his subjects."

The late Mr. Setlur, retired High Court Judge, in an article in the *Hindu* on 12th February 1926, wrote

"Sir M. Visvesvaraya's administration has leavened the Mysore society with the leaven of democratic spirit to a degree never dreamt of before.

"Mr. Rangacharlu organized the State on a democratic basis at the top but Sir M. Visvesvaraya attempted the more daring task of building up from the bottom on the same lines."

Chapter XII

WORK DONE IN MYSORE AFTER RETIREMENT

THE account given in this chapter refers to work done in Mysore State after my retirement from the State service. The succeeding four chapters will explain how I was also employed in other parts of India and on foreign travel after retirement.

In order to give a lucid account of my doings, it has not been possible to adhere to any chronological order in mentioning the engagements

The Mysore Iron and Steel Works

It has been stated before that the second largest productive work attempted within the Mysore State was the Iron Works at Bhadravati. As coal, the usual fuel for operating iron works, could not be had within easy distance, resort was had to the use of wood charcoal obtained from the neighbouring forests for the manufacture of pig iron on the model of charcoal iron factories in the United States of America and Sweden. This project was under consideration for several years and construction was actually sanctioned and started in May 1918.

After my retirement in December 1918, the Works seem to have suffered neglect. The understanding with the suppliers of machinery and Messrs Tata Sons Ltd, who were helping in the construction, was that the Works should be completed and brought into operation in 18 months, that is, before the end of 1919. The actual construction, however, was spread over five years, extending to as late as 1923.

When the work was approaching completion some high Government officers as well as Mr. Marshall of Messrs Perin and Marshall, Consulting Engineers, proposed that the Works should be closed down until the prices of iron, which had gone down to less than half of what they were when the scheme was sanctioned, had appreciably risen. At this stage His Highness the Maharaja sent the then Dewan, Mr. (afterwards Sir Albion) Banerji, to Bombay, where I was residing temporarily, to induce me to take

over control and help Government to put things right. I had to undertake the task, but did so on the understanding that I should be given a free hand, subject to all reasonable financial audit. A Board of Management, with myself as Chairman, was set up to control the Works. In this manner I supervised the Works for six and a half years. During this period there were some pessimistic forecasts. Sir Alfred Chatterton, who was previously in the service of Mysore, in a speech before the Royal Society of Arts in London on 22nd May 1925, stated that "of necessity, this unfortunate enterprise (the Bhadravati Iron Works) will have to be shut down." In spite of such gloomy forebodings the Works gradually improved, notwithstanding a further disastrous fall in the market prices of pig iron and its products which were being manufactured for sale. The efficiency of the Works was greatly increased.

In a statement made by me on the 24th September 1929, at the time of handing over charge of the office of Chairman, the position of the Works was summarized as follows:

"During the last six years, the operations have been reduced to a system, the cost of collection and transport of raw materials brought down to the level originally estimated, the output maintained at a satisfactory level and the cost of production reduced by more than 50 per cent. A local staff has been trained for the various positions, and methods of modern administration have been introduced on the plant. The Works have gradually been made to pay their way."

Mr C. P. Perin, the expert who had designed the Works, visited it in January 1927. He had come to India in connection with the Tata Iron and Steel Works at Jamshedpur, and took the occasion to visit the Mysore Iron Works also. I could not meet him as I was then in Europe. After inspecting the Iron Works he cabled to me in London on 19th January 1927 the following message.

"Congratulations on organization you built up and results being obtained. Stop. Am very much encouraged and will so state to His Highness this evening. With best wishes. Perin."

His Highness the Maharaja thereafter wrote me a letter on 12th February 1927 from his camp in Delhi, in which he said:

"The Iron Works are, I understand, doing exceedingly

well Mr. Perin saw me when he visited Mysore a short time ago and expressed himself thoroughly satisfied with the arrangements you had made for the carrying on of the work. He was particularly struck by the fact that you were able to dispense with all American labour, and were managing entirely with our own men. It is an achievement which the State should be proud of."

I resigned the office of Chairman of the Board of Management of the Mysore Iron Works in September 1929 for reasons unconnected with the Works

On my resignation, His Highness the Maharaja, in a letter dated 6th October 1929, wrote to me as follows:

"I feel that I cannot allow you to sever your connection with the Works without writing personally to express my great appreciation of the work done by you in connection with them and of the manner in which you have given your time and talents to their development for the last six and a half years. I can assure you that the good work you have done in this direction can never be more appreciated by anyone than by myself."

Sir Mirza M. Ismail, the Dewan at that time, in a letter to me, stated:

"It is no exaggeration to say that, but for your devotion to the undertaking and for the great ability and experience which you brought to bear on the discharge of your responsibilities as head of the organization, the Works would have fared very badly, and I doubt if they would have survived so long"

On hearing of my resignation Mr. Charles P. Perin, the American Consulting Engineer already mentioned, wrote to me a significant letter dated New York, 25th November 1929, which is reproduced below:

"I cannot tell you how sorry I am to learn that you have retired from the Board of Management of the Mysore Government Iron Works.

"You speak of the works having benefited by our personal interest I feel that it would not have existed except for you. We are very much interested in the two documents which you sent us and I can only hope that the Market may turn so that

the soundness of the original judgment to build the works may be proven.

"As to yourself I should like to say that in my broad experience I have rarely met a man for whom I had a deeper respect not only for his moral character and his ideals and earnest patriotism, but also engineering ability."

Very recently, in January 1950, that is, 20 years after my retirement as Chairman, I had occasion to visit the Works at the request of the Minister for Industries. In a speech I made on the occasion of the Works Day celebrations, mention was made of the present position of the Works and their future prospects in these terms:

"By 1949, the gross value of products had risen to Rs. 1.69 crores and the net return to Rs. 13.1 lakhs or 6 per cent. on the capital.

"The Works have already repaid the capital spent on them in the shape of a depreciation fund.

"With the expansion and development in several stages of progress, the capital value of the Works will increase to nearly Rs. 5 crores. When the Works are completed, the annual gross income, as is usual in such industries, may be expected to rise to very nearly Rs. 5 crores and in the next two or three years' time they are likely to yield a net income annually to Government of the order of half a crore."

Sri Jaya Chamarajendra Occupational Institute

When I resigned from the Mysore Iron and Steel Works, a fairly large sum was due to me as fee for six and a half years, according to the understanding with the Government at the time of my taking office as Chairman in 1923. I handed back this sum to the Government with a request that an occupational institute may be established for the State at Bangalore, treating the amount as a nucleus. I also drew up and submitted a scheme for an occupational institute. The Government, of which Mr. N. Madhava Rao was Dewan, accepted this proposal and were pleased to spend further large amounts in establishing and maintaining the Institute.

At my suggestion His Highness the present Maharaja was graciously pleased to allow the Institute to be named after him.

It is now known as the Sri Jaya Chamarajendra Occupational Institute.

Cauvery Canal Committee

With regard to the Cauvery Reservoir Scheme, I found Government were keen on developing the works on the lines laid down by me and accordingly continued to obtain my advice at every stage. In a letter dated 24th June 1924, His Highness expressed the hope that I would "continue to take an interest in the scheme which is your own in a special degree" To meet the wishes of Government I consented to be Chairman of a committee to advise and make recommendations in connection with the alignment and construction of the projected high canal system under the reservoir to develop irrigation in the Cauvery Valley. The scheme recommended by the Committee was sanctioned and I continued to supervise the construction of the canal and tunnel works from time to time.

The Block System, which had been successfully worked on the Nira Canal in the Bombay Province, was also introduced here under the supervision of the Chief Engineer, Mr. K. R. Seshachar.

The Krishnarajasagara Scheme was a combined irrigation and hydro-electric power supply proposition and as such it is now yielding, as already stated, a revenue to Government, taking both direct and indirect income into account, of about Rs 1½ crores. The project in 1948-49 yielded a net return of 7.25 per cent. according to figures given in the Budget and, taking both direct and indirect revenue into account, the return has been estimated approximately, by a former Chief Engineer as well as the present Special Chief Engineer, at over 15 per cent.

The New Bangalore Water-supply Scheme

The old water-supply of Bangalore had become wholly inadequate for the city's needs. The Government, at my suggestion, appointed a committee to submit proposals for an increased supply, and I was asked to be the Chairman. The scheme suggested by the Committee provided for the construction of a reservoir capable of storing over 3,000 million cubic feet of water and delivering to the city of Bangalore 10 million gallons of filtered water daily through a rising main, 16 miles long, against a head of nearly 1,000 feet.

Attempt to Start an Automobile Industry in Mysore

The automobile project which I brought to India from my tour in Europe and America in 1935 was, as will be explained later in Chapter XVI on travels, not allowed to be established by the Government of India, it was stated, on account of the war. An attempt was made to start the industry in Bangalore and the Government of Mysore were also willing to assist. Sir Mirza M. Ismail, Dewan, who was enthusiastic in this matter, republished my report, and was prepared to start the industry in the State. The Chrysler Corporation of America were willing to participate in the construction and afford all necessary facilities. While preparations were in progress, the Government of India seem to have asked the Resident in Mysore to persuade His Highness the Maharaja not to agree to the proposal. The idea had therefore to be abandoned.

The Hindustan Aircraft Factory

I visited all the principal automobile factories both in Europe and America and on return to India published a scheme in 1936 for establishing the automobile industry in this country. Mr. Walchand Hirachand of Bombay was desirous of starting it. At his request the Congress Government, then in power in Bombay, deputed Mr. P. B. Advani, Government Director of Industries, to proceed to America in 1939 as Technical Adviser with Mr. Walchand.

In the course of his return journey by air, Mr. Advani came into contact with Mr. W. D. Pawley, an American aircraft expert who was on his way to China, and in the course of conversation asked him for a scheme for an aircraft factory for India. Mr. Pawley complied with this request. The project was transmitted by Mr. Walchand Hirachand to the Commander-in-Chief in India, asking for facilities to start the industry. For six months or more no action was taken. After the Dunkirk disaster the British Government woke up to the necessity of an aircraft factory in India and arranged for the establishment of one in Bangalore with Messrs. Walchand Hirachand and Company as Managing Agents, under the expert guidance of Mr. W. D. Pawley.

The Aircraft Factory was constructed by Mr. Walchand and was successfully established. The Factory was subsequently taken over by the Government of India in partnership with the

Government of Mysore. For one reason or another, perhaps through distrust in the capacity of Indian management, the manufacture of aircraft was suspended for a long time. It is hoped full advantage will be taken of the Factory, at least in future, to manufacture complete aircraft to meet Government and public needs—

A Scheme for Rural Industrialization

A Scheme for Rural Industrialization was drawn up by me as President of the All-India Manufacturers' Organization and submitted to the Government of India in 1949. The action that the Government took was to circulate it to all the States without any recommendation of their own.

The Government of Mysore readily accepted the scheme and are engaged in introducing it in two districts as a first step. If it proves beneficial to these districts, it is proposed to extend it to all other rural regions in the State. This work is new and has been in operation for only six months. It is being carried on by an officer of the State Department of Industries under my advice and has made a promising beginning. I cannot speak of progress in terms of any new industries actually started or in operation. There has not been sufficient time to look for results.

WORK AS CONSULTING ENGINEER AND ADVISER

ALMOST all the work described in this chapter refers to work done as Consulting Engineer or Adviser after retirement from regular Government service. Work of this class, every one of which I undertook by invitation, may be placed under four heads:

- (1) As Adviser to the Municipal Corporations of the cities of Bombay and Karachi on administration, finance, civic improvements and developments generally;
- (2) Water-supply Schemes and proposals for a large number of cities and towns;
- (3) Designs of Drainage Schemes for certain cities and towns; and
- (4) Other special engagements.

The work actually done under each of these four heads will now be briefly referred to.

Bombay City Corporation

In the boom period immediately following the First World War, the Bombay Corporation started large schemes of development and expansion and sanctioned establishments and funds on a liberal scale for their execution. But when trade depression set in about 1922-23, it was found necessary to reduce expenditure and so a Retrenchment Committee was set up. The Corporation at the instance of this Committee invited me to assist them in the practical work of retrenchment. One request was that I should furnish a preliminary report embodying proposals for reduction of expenditure and for reforms needed in the various departments of the municipal administration.

I was engaged on this work for about six weeks in the first instance. At the end of that period a preliminary report that had been asked for was furnished. In this report recommendations were made for a reduction in expenditure of Rs. 12 to 15 lakhs in departments in which retrenchment was possible. On the 17th July 1924, the Corporation approved, practically in its entirety, the

programme of retrenchment and reforms outlined for adoption.

My final report was submitted on 31st January 1925. By this date the retrenchment proposals made in the earlier report had been carried out and savings up to Rs 11.23 lakhs had been actually effected. The final report was in two parts. The first part contained a review of the city's economic needs, of its public works and public utility undertakings. Questions of Greater Bombay and suburban extensions were also gone into. The second part of the report reviewed the progress of retrenchment, further scope for the same, and suggested certain specific reforms and reorganization in the engineering departments.

Two essential reforms suggested in the administration were: (1) the decentralization of functions with allocation of specific duties to heads of departments and (2) the appointment of an Executive Committee on the English model to control the details of departmental administration in conjunction with departmental heads.

The setting up of a Municipal Research Bureau on the lines adopted in the principal cities of the West, particularly in the United States of America, was recommended. The general object of the Bureau suggested was to work for the efficiency of the services, improvement of the revenue, economy of expenditure and reduction of tax rates. Among the city's needs, special attention was drawn to the necessity for stimulating wealth-producing activities by providing technical and commercial education for young men, liberal exemption from taxes in the case of new manufacturing plants and in various other ways. The desirability of providing adequate facilities for housing workmen was also stressed. It was pointed out that the Bombay Corporation was not rendering any appreciable help to industries within municipal limits and special attention was drawn to the need for a new industrial suburb.

In regard to public utilities, such as water, gas, electricity, etc., which, with the exception of the first named utility were in the hands of private companies, a system of stricter control by the Municipal Corporation was urged.

Common ideals and unity of aim among all the agencies working for the good of the city was the first requisite of a city's healthy development. If the public are kept fully informed of the

utility and beneficent objects of the schemes contemplated, the development movement would receive a great stimulus. It was, therefore, suggested that the Government be moved to bring into existence a Central Board or Commission representing the various interests, including the local authorities of the suburbs. In Great Britain, it was stated, municipal schemes formed the subject of a detailed public enquiry. In other countries also, city planning schemes benefited greatly by public scrutiny and criticism. If the Central Board proposed for Bombay did nothing more than meet for a week once a quarter, to hear the views of leading citizens and experts on the various schemes for the advancement of the city, it will have served a very worthy purpose.

Karachi Municipal Finances and Administration

In a letter dated 26th July 1924, I was invited by the President of the Karachi Municipality "to undertake a thorough investigation of the financial position of the Karachi Municipality" and to suggest retrenchment and reforms. In a later communication I was asked "to advise about the reorganization of the various departments and staff." I was engaged on this work for six weeks and submitted a report entitled "Karachi Municipal Finances and Administration, a Survey and Recommendations." The report partook of the nature of a City Survey commonly undertaken in countries like the United States of America and Canada and it endeavoured to present "a bird's-eye view of the principal needs of the city, accompanied by suggestions and recommendations on the best methods of supplying the same." The report contained a survey of the financial position of the Corporation, a review of the work of the municipal departments and staff and a forecast of future plans and policies. The net effect of the retrenchments proposed was "the saving of Rs. 3.65 lakhs or about 9 per cent." In regard to the Municipal Departments, the establishment of a Public Works Committee and of a Stores and Contracts Committee was recommended. It was pointed out that the municipal finances of Karachi bore favourable comparison with those of other Indian cities. With regard to criticisms levelled against them, the report quoted what an American said of British finances after the war: "They say the finances are going to the dogs, although it does so leisurely, that it does not get there."

The report stated that the future of Karachi, which was full of promise, was what the leading citizens might make of it "If the present situation is boldly and judiciously handled, Karachi with its opportunities may become at no distant date a humming centre of industry, a great entrepot and a flourishing port."

The report also recommended the appointment by Government of a Central Advisory Board, with a strong representation on it for the Municipality, for co-ordinating the work of, and ensuring harmony of plan and action among the several agencies engaged in developing the city and the port of Karachi

A view was expressed in the report that the municipal administration compared favourably in efficiency with other cities in India. An enterprising citizen of Karachi, however, said to me, "Whenever I return from a visit to Europe a feeling of depression comes over me. While in England and Europe they travel by miles, our advance here can be measured only by inches." The Karachi Municipality might take lessons from the more progressive and wideawake cities outside the country and endeavour to do things better, that is, endeavour to keep all its wants and deficiencies under constant investigation to ensure that no important need was overlooked.

Water-supply of Cities and Towns

After retirement from Government service I received requests from a large number of towns to suggest practical schemes, chiefly for water-supply. My help to cities and towns in this matter varied greatly in character and scope and came under three heads, namely,

- (1) Furnishing complete independent schemes;
- (2) Suggestions for remedying defects by additions or alterations to existing water-supply schemes; and
- (3) Advice on specific defects or on changes needed

In regard to water-supply schemes, it may perhaps be stated that some of the work I did was while in Government service and the rest in the capacity of Consulting Engineer and Adviser. The work done in the latter capacity was more important. Every one of these developments undertaken after retirement was at the special request of the Government or the municipal authority concerned.

I have already stated that the earliest venture in the direction was to furnish a water-supply scheme for Dhulia in Khandesh, which also included the construction of a tank for the purpose. This was about the year 1886. The next scheme which engaged my attention was the water-supply for the town of Sukkur in Sind.

Then followed, in 1896, employment for a short period at the commencement of construction of the Surat Water-works.

From 1898 to 1904 I was in charge of the water-works of Poona and Kirkee Cantonments, including the bulk supply of water from a canal to Poona City. The storage lake for water-supply to Poona City was enlarged by the installation of automatic gates for storing increased supply.

The first water-supply scheme for Nasik City was outlined by me about the year 1907. The work was actually carried out by the Executive Engineer of the Nasik District.

An outline scheme for water-supply to Dharwar was furnished by me and the Executive Engineer of the Dharwar District executed the work.

Similar help was given in regard to the water-supply of Bijapur, including the construction of a storage tank.

A water-supply scheme for Belgaum was prepared and supplied at the request of the municipality of that city.

I have already referred to the help given to the Kolhapur water-supply.

An outline scheme of water-supply was furnished to Akalkot in the Sholapur District.

The work done for the water-supply of Aden has been already referred to.

I had occasion to advise Indore City at the request of the Government of Indore State when the water-works of that city were under execution.

Gwalior City was visited by me two or three times at the request of the Government of that State to advise on the State Irrigation Schemes and also on the rebuilding of the Tigra Dam (the storage reservoir for the water-supply of Gwalior City) which had been washed away.

At the request of the Hyderabad (Sind) Municipality, I

furnished the design for the settling tanks which were constructed for the purification of the water of the Indus River.

On two or three occasions I was invited to advise the Bombay Municipal Corporation in regard to its water-supply. On one of these occasions a Superintending Engineer was associated with me.

Another original scheme suggested was for the water-supply of Nagpur City from a neighbouring river. I stayed in Nagpur for three weeks and suggested an outline scheme which was carried out successfully under the supervision of a committee of members recommended by me.

At the request of the Government of Goa I visited the port of Goa and supplied an outline scheme for its water-supply.

Proposals were supplied at the request of the Rajkot (Kathiawar) Municipality for rebuilding its Water-supply Storage Reservoir, the earthen dam of which had been breached.

The storage arrangements for the water-supply of Bhavnagar City in Kathiawar were enlarged and rebuilt under my supervision.

Besides the above, both when I was in office as Sanitary Engineer to the Bombay Government and later after retirement from service, I had had occasion to give advice on questions connected with water-supply of several other cities and towns such as Baroda, Sangli, Wankaner, Morvi, Pandharpur and Ahmednagar.

It has been stated in a previous chapter that a new water-supply scheme for Bangalore was designed by a committee of which I was Chairman.

Modern Drainage Schemes

A modern pumping pipe sewerage scheme was designed by me for Poona City for the first time about the year 1908. A European engineer was entrusted with its construction.

The drainage scheme for Hyderabad City (Deccan), which was designed and constructed under my supervision, has been already referred to.

Proposals for drainage of the town of Dhulia were submitted about the year 1890.

The drainage scheme supplied to Sukkur has been referred to as also the scheme to the port of Aden.

The drainage scheme for Indore was carried out for a time by a competent engineer under my supervision.

As stated earlier, a drainage scheme for Mysore City was prepared during the time I was Chief Engineer of the Mysore State and it was subsequently implemented.

It may be of interest to the reader if I state that when I toured through Europe in 1908 I visited some half a dozen cities which had efficient drainage systems. I had occasion to walk through deep underground sewers in Milan, Dusseldorf, London and Paris to study their design and construction. Some of them were at a depth of over 80 feet underground. During such visits and inspections the sewers were specially lighted and ventilated.

Other Special Engagements

Among other schemes may be mentioned the reports on flood protection measures in Orissa undertaken at the invitation of Mahatma Gandhi. A Congress leader, Mr. Nityananda Kanungo, was in office as Minister for Public Works in the Orissa Government. I first visited the Province, inspected the flood-ridden regions in April 1939 and submitted a report. I also suggested the appointment of a committee composed of an Engineer from Mysore, a European Superintending Engineer from Bombay and other local officers to go further into the matter and work out details. On account of lack of financial resources no large measures were undertaken. The present Ministry connected with the Central Water, Power, Irrigation and Navigation Commission of the Government of India has since designed and started the construction of a reservoir, known as the Hirakud Dam, in the upper reaches of the Mahanadi River.

In 1947 I visited the Tungabhadra Dam Works, at the joint request of the Public Works Departments of Madras and Hyderabad (Deccan), to advise on a question of engineering importance about which differences of opinion existed between the Chief Engineers of the two Governments. After discussion an agreed decision was arrived at.

At the request of His Highness the Nawab of Bhopal, I examined the question of power and water-supply to Bhopal City and submitted suitable proposals.

During the year 1949 I visited Saurashtra at the request of its Government to advise on the sites chosen for locating dams for several storage reservoirs in that State.

I have advised also on town-planning schemes for towns and cities like Hyderabad (Deccan), already referred to, and Indore. Lord Sydenham, the Governor of Bombay, referred to one of my proposals for Bombay City in a speech in opening the New Market at Andheri (Bombay), as follows:

“And now I wish to say a few words about the general development of Salsette, in which I am deeply interested. This question was first impressed upon me by a report by Mr. Visvesvaraya which I read some time ago and by a conversation which I had with that very able engineer.”

—(*Times of India*, 11th January 1912)

PARTICIPATION IN GOVERNMENT AND PUBLIC COMMITTEES

WHILE in Government service I had occasion to serve on a number of committees in the ordinary course of duty but for the purposes of this book I propose to refer only to a few principal committees on which I served as a member or Chairman after my retirement from Government service.

Bombay Technical and Industrial Education Committee, 1921-22

One of the earliest committees of which I was appointed Chairman after I left service was the Technical and Industrial Education Committee (1921-22) set up by the Government of Bombay. Immediately after the introduction of the Montford Reforms in 1920, a Congress leader had become Minister for Education. The Committee appointed consisted of 10 European and 7 Indian members and I was invited to work as Chairman. The object was to enquire into the present equipment of the Bombay Presidency in respect of Technical and industrial education and to draw up a comprehensive scheme to meet its future needs. The terms of reference, as summarised in the report, required "the submission of proposals to supply technical education needed by organizers and experts to fill leading executive positions in business, to supply a class of technical assistants, superintendents, also foremen, etc., for subordinate positions, and to train the rank and file of workers for the various industries and industrial occupations of the Presidency."

The members worked harmoniously in the first stage of the investigation and we produced a practically unanimous preliminary report.

The work occupied nearly a year but as it proceeded Lord Lloyd, the then Governor of Bombay, suggested to me at a personal interview that I should be content with putting forward proposals for the training of apprentices. To this suggestion I demurred. All the Indian members and myself who were in the

minority, however, went the whole hog and recommended the establishment of an Institute of Technology and various other wants for technical education for which there was need. In the end all the European members went solidly against all proposals which had any extended permanent scope. The report was thus in two parts, one by the European section of ten members and the other by the Indian section which consisted of seven members. I had the report drafted under my supervision in the hope that it may be accepted by all the members. But the European members in a body altered the report to suit their own views. The Indian members accepted my draft in its entirety but we were in a minority.

Though the Committee had been appointed at the desire of the newly constituted Provincial Assembly, it was clear, from what Lord Lloyd said to me in person, that the Government of Bombay had no intention of developing higher technological education in the Province. In the end I found I had wasted nearly a year on profitless work.

Bombay University Committee for Promoting Chemical Industries

The public were disappointed that no results accrued from the elaborate labours of the Committee. The Bombay University also seemed disappointed but wanted to know if it could do anything to promote technological education from its own resources. The Committee on Technical and Industrial Education had recommended that the University of Bombay should constitute a Faculty of Technology and that a College of Technology should be established in Bombay City. The University wanted to take action on this proposal but before a decision could be reached the Government of Bombay appointed a Committee on University Reform. This Committee too concurred with the recommendations which had been made by the Technical and Industrial Education Committee.

The Academic Council of the Bombay University in March 1930 considered the question and approved of Mr. K. M. Munshi's proposition to appoint a committee with myself as Chairman "to draw up a detailed scheme of a University Department of Chemical Technology."

Accordingly, a committee to investigate the prospects of

developing chemical industries was appointed by the University in March 1930 consisting of seven Indian and three European members. It must be said to the credit of the Bombay University that it chose for the Committee expert chemists and industrialists, both European and Indian, in the Presidency. On this Committee also the University invited me to serve as Chairman.

This work occupied about six months and it resulted in a unanimous report. This was accepted by the University. To give effect to this report, the University established an institute of their own in the shape of a Chemical Technology Institute and located it temporarily in the Fort area and later permanently in the Matunga area of Bombay. This does great credit to the patriotism of the University. The Institute has been helped also by endowments from private donors. It is doing well at present and may be said to be in a flourishing condition.

Irrigation Enquiry Committee, Bombay, 1938

This Committee was set up by the Government of Bombay towards the end of December 1937 to examine the whole question of irrigation policy and allied matters and submit necessary recommendations and proposals. The Committee consisted of 10 members, official and non-official, including high European officers of the Government like the Commissioner, Central Division, Director of Agriculture and Superintending Engineers of Irrigation Circles. I was invited to work as Chairman. The terms of reference to the Committee included such matters as the general irrigation policy of Government in regard to the supply of water to different classes of crops, for industrial undertakings like sugar factories and mills, and for non-agricultural purposes such as supply to municipalities, railways, etc., revision of water rates and canal rates and steps to be taken in cases of water-logging, etc. The Committee was engaged on this work for nearly five months; it received replies to questionnaires and memoranda, examined witnesses and toured important centres and submitted a practically unanimous report. The report dealt fully with such questions as the present position of irrigation works in the Presidency, equitable distribution of water, supervision and control of canals, rates of assessment and other analogous matters.

A brief reference is sufficient here to certain salient and

distinctive features of administration and policy in irrigation suggested by the Committee. The Committee recommended the introduction of the "Block System" of irrigation suited to local conditions on all the canals in the Presidency. The object of the system, as stated in the report, was "to distribute the benefits of irrigation works over as large a number of villages as possible and at the same time to concentrate the irrigation given to each village to areas or blocks of a specified extent and in selected soils and situations favourable to irrigation." The main advantages claimed were economy of water and simplification of canal administration. They recommended distribution of water for irrigation on a basis of measurement and charging for the water on a volumetric basis. The adoption of an accurate system of measuring devices and their maintenance in an efficient condition was recommended. The necessity for continuous research in irrigation matters was stressed and the establishment of a research organization suggested.

The changes suggested in the administrative organization, supervision and control of irrigation works kept the following objects in view:

- (1) To bring Government officials and the cultivators into closer touch so that they may have a better understanding of each other and work harmoniously to mutual advantage.
- (2) To induce cultivators engaged in irrigation to think, plan and administer for themselves and to work in a co-operative spirit; in other words, to make them more self-reliant.
- (3) To provide for the continuous study of the irrigation needs of the Province and to maintain continuity of investigation and research into the various problems

For these purposes the Committee recommended the establishment of a Provincial Irrigation Board consisting of officials and non-officials with an executive staff and an Irrigation Research Division or a Bureau of Irrigation Research. The Committee also suggested the setting up of Canal Advisory Committees with the Executive Engineer as Chairman and nominated and elected representatives of irrigators as members. The convening of a conference of irrigators, maintenance of irrigation statistics and

the establishment of canal *panchayats* were among the other recommendations made.

The Government of Bombay adopted most of the measures recommended with modifications and alterations in certain cases, as per their resolution dated 23rd March, 1939.

New Capital Enquiry Committee, 1922

The Government of India constituted, in 1922, the New Capital Enquiry Committee which had for its object the formulation of a sound scheme for the construction of the Viceroy's residence, Central Government offices, Assembly Buildings, etc., in consequence of the transfer of the capital of India from Calcutta to New Delhi. This Committee, of which I was a member, was presided over by Sir Malcolm (now Lord) Hailey. The construction of the buildings was in progress while their financial and other aspects were under investigation by the Committee. The Committee at intervals inspected the works of Government House and other associated buildings which were under construction and also the plans for extensions and drainage of New Delhi which were under preparation.

The Indian Economic Enquiry Committee, 1925

The Central Assembly which was constituted in accordance with the Montford Reforms wanted statistics, particularly of industries, to be collected and supplied to the public. To stop the agitation, the Government of India appointed the Indian Economic Enquiry Committee. Pandit Hari Kishan Kaul, who afterwards became Raja Hari Kishan Kaul, was a member; Mr. Burnett-Hurst, a Professor, was appointed member and Secretary of the Committee and I was invited to be the Chairman. The terms of reference to the Committee were as follows:

"To examine the material at present available for framing an estimate of the economic condition of the various classes of the people of British India, to report on its adequacy, and to make recommendations as to the best manner in which it may be supplemented and as to the lines on which a general economic survey should be carried out, with an estimate of the expenditure involved in giving effect to such recommendations."

The Committee worked for over seven months, travelled over many parts of the country, including Burma which was then a part of India, and produced a report. Mr. Burnett-Hurst, member and Secretary, wrote a dissenting minute.

The Committee in their report stressed the need for an economic survey, the object of which was "to collect statistical data and information which would facilitate the shaping of economic policies and the solution of the current economic problems with a view to meeting existing deficiencies, improving resources and increasing the country's prosperity generally." The existing statistical material was examined and suggestions were made for collection of data, for preparation and publication of accurate complete statistics of production, income, labour, wages, prices, cost of living index and other cognate matters. The establishment by legislation of a suitable statistical organization, with Central and Provincial Bureaus, and the co-ordination of statistical work, as in the Dominions, were among the special recommendations made. I had studied the statistical systems in Western countries and recommended a suitable system for local conditions based mainly on the system in use in Canada.

The report was referred to by Lord Reading, the then Viceroy, apparently with approval, at a meeting of the Central Legislative Assembly. No active measures seem to have been taken, however, and the position in regard to statistics continues to be unsatisfactory even to this day.

The Back Bay Enquiry Committee, 1926

This was a Committee of Enquiry set up by the Government of India with Sir Grimwood Mears, Chief Justice of Allahabad, as President. There were three other members, two Indians including myself, and one European who had seen service in Egypt. The Secretary was a European officer of the Indian Civil Service.

The terms of reference to the Committee were "To enquire into the history of the inception and operation of the 'Back Bay Reclamation Scheme' and to make recommendations as regards future operations."

A large number of witnesses were examined in Bombay, including members of the Bombay City Corporation and a

European contractor who had been employed previously on the works.

Meetings were also held in London, first in a building in Parliament Street, and later in a room in Parliament House itself. Here Lord Lloyd, who was then High Commissioner in Egypt, was examined by us at some length.

The Committee submitted a scheme recommending the development of the area already reclaimed, limiting further reclamation for the time being, and curtailing some of the new works projected which had not been put in hand.

Bangalore Political Disturbances Enquiry Committee, 1929

In July 1928 there were Hindu-Muslim disturbances in Bangalore City. In January 1929 the Government of Mysore invited me to be Chairman of a committee set up to enquire into them. I was unwilling at first but had to accept the responsibility at the special desire of His Highness the Maharaja. The Committee made enquiries and worked steadily for three or four months, recorded the evidence of a large number of witnesses and submitted a report. The report was practically unanimous except for a dissenting note by one member who was a leader of one of the two communities concerned in the disturbances.

Sukkur Barrage Works Committee, 1929

Various complaints appeared in the Press about the way the Sukkur Barrage Works on the Indus River in Sind were being constructed and about the prospects of those works. The Bombay Government thought it necessary to have a committee composed only of Indian engineers to investigate and report on the state and prospect of the works. Two members were appointed, of whom I was the senior member; and Mr. Ahmed Ali (afterwards Nawab Ali Nawaz Jung), Chief Engineer of Hyderabad, already referred to, who had early English training, was the other member. We worked in the hottest part of the year for about three and a half months, visited the Barrage and the new canals constructed, and submitted a report which was accepted by the Bombay Government as satisfactory. In acknowledging the report, Sir Frederick Sykes, the Governor of Bombay at the time, wrote to me a letter in which he said:

"The report is obviously an excellent one. I feel convinced

that the report will help in many ways to forward the project and its objects to the conclusion of great benefit we all so much desire."

I learn that the recommendations were acted upon for about ten years thereafter.

Chapter XV

PARTICIPATION IN POLITICAL AND OTHER CONFERENCES

A COMMITTEE of Princes and Ministers (or Dewans) was constituted in 1917 in order to consider and make recommendations regarding the future position of the Indian States in relation to the Government of India. I was a member of that Committee when I was in office as Dewan and attended two of its meetings, one of which was held at Bikaner and the other at Patiala. The enlightened Maharaja of Bikaner, Sir Ganga Singh Bahadur, was its Chairman and the Maharaja of Alwar was a member. Sir (afterwards Lord) Sinha of Raipur was also one of the members of the Committee.

Various reforms connected with Indian States were suggested or discussed and resolutions passed. Since most of the States are now merged in the Indian Union, the resolutions then passed and the recommendations made are of no practical value and, therefore, are not referred to here.

I had the opportunity of taking part as President of the Indian Science Congress, at its annual session, held in Lucknow in 1923, and again as President in the Indian Economic Conference, held in Bombay in 1924. Members of the newly constituted Court of the Indian Institute of Science, Bangalore, elected me President year after year for nine years in succession commencing from 1938. I retired from that position at my own request in 1947.

I was invited to take part in two Political Conferences to which a brief reference will be made.

The Bombay All-Parties Political Conference of 1922

When His Royal Highness the Prince of Wales landed in Bombay on the 17th November 1921, there was a *hartal* and a bonfire of foreign cloth in the city followed by rioting and bloodshed. The same day a peaceful *hartal* was observed in Calcutta, but the Government of Bengal proclaimed the enrolment of Congress volunteers illegal under the law and a large

number of arrests followed, including that of the President-elect of the National Congress, Mr. C R. Das. A few days later the Viceroy went to Calcutta where the Prince of Wales was to spend Christmas. In this emergency during the Viceroy's stay in Calcutta, the Congress leader, Pandit Madan Mohan Malaviya, in consultation with some other leaders, had conversations with the Viceroy with a view to bring about a Round Table Conference to discuss and settle the questions agitating the public mind. These conversations led to a deputation headed by Pandit Madan Mohan Malaviya which waited on the Viceroy on the 21st December 1921.

At the invitation of the Pandit I joined the party which was to meet the Viceroy at Calcutta. The deputation, which included Mrs Annie Besant, discussed proposals for organizing a Round Table Conference between the representatives of Government and the political leaders of all parties in the country to find a solution for the more urgent political problems which were agitating the public mind in those days. Mahatma Gandhi had decided to non-co-operate but was not unwilling to accept any reasonable alternative which might lead to the more urgent demands of the country being met.

The Viceroy gave no clear indication at the Calcutta meeting whether or not a Round Table Conference would be convened. He was, however, careful to tell the deputation that he would be sorry if any observations he had made should be construed into a refusal for all time to consider the convening of a conference. And he added

"Certainly, I have not intended by the language I have used to convey that meaning to you. I have had too great experience of life not to appreciate that advantage may be derived from discussions and consultations with others who see from different angles and who may have views to put forward which had not occurred to us."

Pandit Madan Mohan Malaviya then went from Calcutta to Ahmedabad to attend the meeting of the National Congress and to confer on the situation with Mahatma Gandhi. Messrs M. R. Jayakar and M. A. Jinnah were also there. At that conference, the National Congress passed resolutions suspending all activities

of the Congress and calling upon all persons to join volunteer organizations and offer themselves for arrest quietly and without any demonstration. This move foreshadowed individual and mass civil disobedience as the only civilized and effective substitute for an armed rebellion wherever any other remedy for preventing arbitrary and tyrannical authority had failed, but through the exertions of Pandit Madan Mohan Malaviya and Messrs. M. A. Jinnah and M. R. Jayakar, Mahatma Gandhi was willing to accept the endeavours which were being made to bring about a Round Table Conference even at that stage.

Moderate leaders like Pandit Madan Mohan Malaviya induced Mahatma Gandhi to attend an All-Parties Conference to be convened in Bombay. Three hundred and fifty invitations were issued to leading citizens of all parties in the country to a conference of representatives arranged to be held in Bombay, and about 200 attended it. The names of persons who attended as well as the proceedings of that Conference are given in a printed brochure entitled "A Report on the Proceedings of the Bombay Representative Conference," published in January 1922 by the then Secretaries of the Conference, *viz.*, Mr. M. A. Jinnah, Mr. M. R. Jayakar and Mr. K. Natarajan. All the information relating to this All-Parties Conference given in this chapter is taken from that brochure.

When the Conference began Sir C. Sankaran Nair was nominated Chairman or Speaker. He conducted the meeting on the first day; on the second day, however, he disagreed with some of the resolutions passed and chose to retire from the Conference. I was then elected Chairman in his place.

The brochure reports a speech made at this stage by Pandit Madan Mohan Malaviya as follows:

"I regret to say that our esteemed friend Sir Sankaran Nair, who had agreed to preside as a Speaker over this Conference, could not agree to some of the matters incorporated in these resolutions. He felt strongly over these matters and has therefore retired. We are grateful to him for the guidance he has given us in the deliberations of this Committee. On the retirement of Sir Sankaran Nair the Committee elected Sir M. Visvesvaraya as Speaker (cheers). I am sure you approve of the election made by the Committee. I am

grateful to Sir M. Visvesvaraya for having agreed to take the chair at this juncture. The Conference will now proceed to discuss the resolutions which the Committee has drafted."

Mr. M. A. Jinnah then placed before the Conference four resolutions that had been accepted by the Committee. Thereafter several prominent members addressed the meeting regarding subsequent procedure, among whom were Mr. H. P. Mody, Pandit H. N. Kunzru, Mr. Purshotamdas Thakurdas and Pandit Madan Mohan Malaviya.

Mahatma Gandhi having been called upon to explain his position, spoke as follows:

"You will see, there are not many vital changes in the resolutions, as they were read out to you yesterday. This Conference should remember that I do not propose to be a party to the resolutions of this Conference and so far as I am concerned, the non-co-operators also will not become parties. They will not take part in the discussion either. I am humbly of opinion that it is the special prerogative and duty of those, who are not non-co-operators, to consider fully the bearings of these resolutions and to accept them or reject them as they choose . . . If there is any chance of a Round Table Conference, I shall advise the Working Committee to suspend general Civil Disobedience, contemplated by the Ahmedabad Congress resolution.. .I do want to appreciate all the difficulties that face the Government, but the vital principle of these demands is Dominion Status....I have less faith in the strength of my countrymen because they have not suffered enough. Therefore I have got my own misgivings I feel that the Committee that will be appointed will convey this humble message of mine in the name of non-co-operators to the Viceroy that if he wants to convene a Round Table Conference, he should summon that Conference....The worst that may happen is that we may be blotted out from the face of this earth. I am quite willing to be blotted out from the face of the earth so long as I can breathe the free atmosphere of India."

Finally, Mr. M A Jinnah proposed the fifth resolution as follows:

"Without at present going into the particulars of the

demands of the country with reference to the Punjab, Khilafat and Swaraj questions, this Conference hereby appoints a Committee of the following persons to carry on all communications with the Government, on the one hand, and the important political organizations in the country, on the other, with a view to arranging the composition, the dates and other details relating to the holding of the said Round Table Conference, and for all purposes incidental to the carrying out of these resolutions, including, when necessary, the convening of another Representative Conference."

The Committee proposed consisted of 21 persons. Messrs. Jinnah, Jayakar and Natarajan were Secretaries and I continued to be Chairman.

Mahatma Gandhi and other non-co-operators felt precluded on principle from voting at the Conference, but on an informal understanding given by him the Working Committee of the National Congress formally accepted the resolutions of the Conference at a meeting held on the 17th January 1922.

One of the resolutions passed by the Committee of the Representative Conference on 14th February 1922 was the following:

"The Committee conveys its thanks to Mr. Gandhi and the Working Committee for their courtesy in inviting the members of this Committee to attend the meeting of the Working Committee at Bardoli, and in giving Pandit Malaviya and Messrs. Natarajan and Jayakar who attended it, the opportunity of expressing their views before the Working Committee."

The Secretaries of the Conference subsequently addressed the Viceroy, forwarding the resolutions of the Conference, which they thought met his requirements of the 21st December 1921. The Viceroy, however, took a different view and regretted that the proposals in the resolution should have been regarded as a response to the sentiments he expressed in Calcutta. Further correspondence ensued, but in view of the ultimatum of Mahatma Gandhi to the Viceroy, the latter informed the Secretaries that further discussion was futile. As a result of further events, such as the Chauri Chura occurrence, the Bardoli Civil Disobedience Programme, and the arrest and imprisonment of Mahatma Gandhi,

which are matters of history, the Committee felt that events had taken a turn which was not favourable to the calling of another conference contemplated by the resolutions. Thereafter the Committee automatically ceased to function.

South India States Peoples' Conference, 1929

Another fairly important conference to which I was invited to take part as Chairman was the South India States Peoples' Conference, held in Trivandrum on 14th and 15th January 1929, which was attended by representatives from Mysore, Hyderabad, Pudukottah, Cochin and Travancore.

The questions connected with the Indian Constitutional Reforms had reached an important stage and the Conference was convened to assist in their solution and to safeguard, in so far as it lay in the members that met, the interests of the people of Indian States in any organization that might be set up for the future Government of India. In the address delivered at the Conference I dealt with the Indian Constitutional Reforms, the disabilities and special wants of the States' people, and the position of the Indian States and the Chamber of Princes in any future scheme of Federation for India.

The Conference adopted the general principles and provisions embodied in a printed memorandum bearing the title "A Dominion Constitution for India including the States," presented by its Subjects Committee, and set up a permanent Executive Committee consisting of 17 members to take any subsequent further measures that might be found necessary.

FOREIGN TRAVELS — INDUSTRIAL DELEGATION TO EUROPE AND AMERICA

My foreign travels have been somewhat extensive. They will be briefly referred to here to indicate the lines of thought which influenced me in following certain policies within my limited jurisdiction in the later part of my Government service, particularly in Mysore, and in matters in which I interested myself after retirement.

I travelled out of India six times, on five of which I visited America. I trust it will not tire the reader if I mention the approximate dates of each tour and any incidents connected with it.

(1) The first time I went out of India was in the year 1898, after I had served as Assistant to the Chief Engineer for Irrigation, Central Division, Poona.

I travelled in Japan from March 1898 and the tours continued for about three months. I took notes of what I observed as worth noting in Japan and on my return compiled a small book describing my experiences in that country. I did not, however, think that the time was opportune to publish it. Besides, I was then a trusted officer of the Bombay Government. Any comments on policies and actions of Government, even though correct and justified, would have been out of place. Poona at that time was regarded as a centre of political agitation. I wanted to maintain straightforward relations both with the Government and public men. Any criticism of Government policies in those days might have created suspicion and hindered the smooth performance of my executive duties as a Government official.

(2) My second foreign travel was after retirement from the Bombay service in 1908, when I took long leave due to me preparatory to retirement, with the object of spending a couple of years usefully in Europe and America. But this plan was interfered with, as already explained elsewhere, by the message I received while travelling in Italy inviting me to deal with an engineering problem of some magnitude, namely, the destruction

of part of Hyderabad City caused by an extraordinary flood which occurred on the 28th September 1908 and the consequent remedial measures which had to be taken for the future. However, I was able to spend about five months more in Europe and America after accepting the invitation. In the course of this tour, which was most interesting, I spent some time in examining engineering developments in water-supply, dams, drainage, irrigation and other works in Italy, in various parts of Europe, America and Canada. I took notes, but the strenuous occupations in which I busied myself on return to India left me no leisure to record even the more important of my experiences. Although the information I collected helped to enlarge my views, I was not able to reduce it to narrative form. As I was fresh from the work of preparing engineering designs in the Bombay Presidency, I studied for more than two months the soil erosion problem and irrigation and drainage works as practised in Italy. I visited the underground sewers of Milan with the Chief Engineer in charge of the Milan Drainage Works. That officer received me cordially but asked why I bothered myself about such large questions as the design of drainage tunnels, etc., since he understood that all such higher work in India was the monopoly of British officers. I assured him that that was not the case; if Indians with the necessary qualifications worked hard, their services were appreciated and utilized. As a case in point I brought to his notice my deputation to Aden in 1906.

I visited various parts of Europe, including Sweden and Russia, during 1908 and in the early part of 1909. Sweden, Denmark and Holland were very advanced countries even then. I visited St. Petersburg (now Leningrad) by travelling in a boat across the Baltic Sea. From Leningrad I visited Moscow, where the same standard of civilization seemed to prevail, as in the rest of Europe, but the rule was autocratic and discontent prevailed against the Czar's Government.

London constituted the centre for my tours in every direction. I had some old associates and friends there who guided me in my travels and were courteous and helpful.

I next proceeded to New York. There was an association of Indian traders and business men there, men of energy, vitality and ambition. My association with them gave me an opportunity

to learn much about economic developments in America as compared with India. I visited Ottawa and Toronto in Canada and from there proceeded to Detroit to study the automobile industry at the Ford Factory. There were some big reservoirs like the Croton Dam which supplied water to New York, but developments in irrigation in the United States of America did not seem at that time to have made any appreciable advance.

In Canada I was given statistics of every department which was being developed and the statistician, Mr. C. A. Coats, was friendly and helpful. He corresponded with me for some years after I left Canada. This tour ended with a return journey on a second visit to London and France. From Marseilles I returned to Bombay in a P. & O. boat.

(3) The next foreign tour was undertaken in the year 1919, some three months after I had retired from Government service in Mysore. Some friends in Bombay, headed by Sir Vithaldas Damodher Thackersey and Mr. Mulraj Khatau, both closely connected with the cotton mill industry in Bombay, were organizing a "round-the-world" tour with a party of half a dozen friends comprising both ladies and gentlemen. I joined the party and we all decided to go round the world via Ceylon and Singapore. We sailed in a P. & O. boat from Bombay to Colombo, Singapore, Hongkong, Shanghai, and landed in Nagasaki in Japan. I stayed in Japan for about three months. This was my second visit to that country to study modern developments in education, industries, commerce and politics. From there we wanted to go to the United States of America. It was difficult to obtain passages for all of us on one boat, so I had to travel from Yokohama to Canada. The first port reached in Canada was Victoria. There was considerable trade in forest produce in that port. Huge logs of timber were floated down the river, intercepted near Victoria and stored on the river bank for seasoning. The machinery to deal with seasoned wood was very elaborate and complete. There were only two or three men who managed the whole factory which dealt with seasoned wood. Huge logs were cut by machinery into the shapes needed and loaded into railway trucks. Most of this was done automatically by machinery. The railway trucks carried the products to interior markets, often as far as New York, some 3,000 miles by rail.

We studied some industries in America like cement and paper. We proceeded to Detroit to get acquainted with the automobile industry. As I had a circular letter of introduction from the Government of India to some of the countries abroad, I was received with courtesy by manufacturers and Government officers both in Canada and the United States of America. I had been for several years previously a subscriber to a journal known as *Chicago Commerce*. Some professional men who prized that paper in Chicago were cordial and hospitable. This was towards the closing months of 1919. In my previous visit to Ottawa in 1908, I had made friends, who gave appreciable help in this my second visit to the city.

One minor experience of mine impressed me greatly of the integrity of some of the professional men. In Chicago I ordered an article from a professional man and he stated he would leave it in a finished state with his lady secretary by the evening of a particular date. The understanding was that I should pay \$8 for the article but as I was particular about its delivery at a fixed time I promised to pay an extra dollar if the article ordered was satisfactory and delivered in time. I believe it was about 5 p.m. when I visited the shop. He was not in his office then but the packet was ready with his secretary. I found the article ordered satisfactory and paid the cost, together with the extra dollar, so that he might have no complaint that I had forgotten my casual promise. The professional man did not know where I stayed though he knew I was to leave Chicago the following morning. To my surprise he had made the necessary enquiries and came to my hotel the next morning to return the extra dollar before I left on my journey. He complained that I had not left my address with him and he had to make enquiries in two or three hotels to find out where I was staying to return the dollar. I asked him why he did not pocket the money and say nothing, as most business men usually do. I reminded him I had offered the dollar although he had not accepted it. His reply was that he had not earned it and had no right to it. "True, why did you not pocket it? There was nothing to prevent you from doing so," I said. He touched his forehead and said, "If I did that, my peace of mind would be disturbed."

There were some other interesting incidents in the course of this tour in America.

I visited the President of Harvard University and tried to know whether there were any subjects to which that famous seat of learning gave special prominence. I put him the question, "In what subjects does the Harvard University specialise?" "We ride all horses abreast," was the President's characteristic reply.

I went to another university in a central region of America and in course of conversation enquired of the President how much it cost the students there annually for their education. He replied, "We encourage students with scanty means to work and earn their keep in the university." He told me that he himself was one of those who earned money in that way in his student days. He took care to caution me not to repeat the statement to anybody.

In 1920 I tried to study the financial position of the United States of America and visited the head of the Federal Reserve Board in Washington. In course of conversation I put him some questions regarding the finances of India. I asked him if he had any suggestions to offer for their improvement. He began making excuses, telling me how difficult it would be to judge of the conditions in far-off India. I said to him, "I came to you because people here told me you were perhaps the ablest financier in this country. How could you plead that you do not know the financial position of a big country like India?" I had an intelligent guide with me whom he took aside and to whom he said: "Tell this man to go back to his country, change its constitution into that of a national Government and come to me. I shall then be able to give him proper advice."

When I was in Washington I thought I should benefit myself by conversation on world affairs, and particularly industries, with Mr. Herbert Hoover, then Secretary for Commerce. On a previous visit I had made friends in Washington and two of them who knew Mr. Hoover wanted me to go with them to exchange views with him. I had a long conversation with Mr. Hoover on various aspects of national development as I was then thinking of writing the book, "Reconstructing India," which was subsequently published in London. I had learnt he was taking a great deal of interest in the development of American industries. He explained to me how rapidly industries were being developed in his country.

I asked him what he thought was wrong in India and why my countrymen were so backward. He replied, "You people have no hustle in you," which meant, of course, that Indians were slow, sleepy and easy-going.

I then returned to London and stayed there for about ten months to write a book which I named "Reconstructing India." It was printed and published in 1920 by Messrs P. S King and Son, Ltd., London. It was convenient to complete the book in London itself because the India Office Library could supply all the information I wanted.

In the India Section of the Royal Society of Arts, London, there was a discussion on Indian problems and I was invited to take part in it Mr Edwin S Montagu, Secretary of State for India, was in the chair.

When I subsequently had an interview with Mr. Montagu, he offered me a seat in the Council of the Secretary of State for India, which had been vacated by Sir Prabhashankar D. Pattani of Bhavnagar. Sir Prabhashankar also tried to induce me to take his place. It did not fit in with the plans I had in view to accept that office, where opportunities to an Indian for doing any useful work were very limited.

After the publication of the book "Reconstructing India" I returned to Bombay.

(4) My fourth foreign travel was in 1926 when the Government of India appointed me as an engineer member on the Back Bay Reclamation Enquiry Committee. The origin of, and the work done by, this Committee have already been explained

After the Committee work in London was over, I undertook journeys to places in Europe and America to study steel manufacture and wood distillation problems. This work was undertaken in the interests of the Mysore Iron Works, of which I had charge as Chairman, Board of Management. It was in the course of this tour that I tried to sell charcoal pig iron from Bhadravati (Mysore State) in the United States of America. As I have stated on one or two public occasions before, we were able to sell charcoal iron cheaper in America than the Americans could manufacture the product themselves. I collected the details I wanted both in the United States of America and in Sweden where the iron and steel industry was carried on with charcoal fuel.

During this tour I noticed that one firm of consulting engineers looked after the technical interests of some 80 wood distillation plants in and around Berlin.

(5) The fifth time I went out of India was in 1935 to study the designs and working details of the automobile industry mentioned in a previous chapter. I spent about six months both in Europe and America studying the manufacture of automobiles in the leading factories.

My first visit was to the English factories in Coventry, Oxford, Birmingham, Derby, and other places.

In Birmingham I met Lord Austin who was kind enough to get estimates prepared for me for the establishment of the industry in Bombay. In the end he advised me that for Indian conditions an American medium-sized car was the proper type. If we wanted a small car, his own (Austin) type, he said, would be very suitable.

I then went to the Continent to study in Italy, Germany and France, and stayed one month at a watering station, Aix-les-Bains, near Turin.

I also visited the factory at Turin where the "Fiat" car was being manufactured. One peculiar feature of the Fiat Car Factory was that it was located in a building several stories high and material was carried from the ground to the top floors on trucks up a rising spiral tramway. The operations of the factory were carried on on both sides of the spiral.

I then proceeded to America and while in New York met a Russian engineer whose mission was to collect information for the establishment of an automobile industry in Russia. He told me that there were 40 Russian engineers with him in the United States and that they also were there to collect technical and other information with a view to manufacture, in Russia, a complete automobile on the American model.

I next visited Mr. Charles E. Sorensen, the well-known General Manager of the Ford Factory, and also Mr. W. S. Knudson and Mr. Kitteridge, the two experts who controlled the General Motors Corporation at Detroit. I spent about a month in Detroit investigating how best a factory could be started in India. Estimates were prepared and they were checked by heads of automobile establishments in several places in America, mostly in Detroit and New York. I have stated elsewhere how all this effort

ended in India. For a long time the Government of India would not allow the industry to be started but when they did, there was no unity or co-operation among the Bombay business men, who in 1934-35 were solidly in favour of the industry and had assured me full support.

The report and project which I brought from America was printed twice in India.

As a result of this report and my personal appeals, the Congress Government of Bombay tentatively offered certain concessions to Mr. Walchand Hirachand and his associates to establish an automobile plant in the Province of Bombay. They also placed the then Director of Industries (Mr. P. B. Advani) on special duty to assist Mr. Walchand in technical investigations and for negotiating an agreement with British or American manufacturers of automobiles. Both these gentlemen proceeded to Detroit in the United States of America and made personal contacts with Mr. Henry Ford himself and his General Manager, Mr. Sorensen. They spent some weeks with the engineers of the Ford Plant and carried out investigation of the technical and economic aspects of an automobile plant for India. After this investigation, when the Ford organization was satisfied that the scheme previously put forward was technically and economically sound, the two gentlemen, Mr. Walchand Hirachand and Mr. Advani, cabled to the Government of Bombay and to me that the original scheme was feasible. Mr. Advani negotiated an agreement with the Ford Company, providing for technical assistance to the Indian organization. At a later stage, Mr. Henry Ford was advised that he had an agreement with the Canadian Ford Motor Company under which all rights of sale and manufacture in the British Commonwealth had been assigned to the Canadian Ford Motor Company. The latter Company, which was contacted, was unwilling to enter into any agreement unless it owned and controlled 51 per cent. of the share capital. This being unacceptable, Mr. Advani then contacted the Chrysler Corporation (also of Detroit) and after that organization too was satisfied, from the technical and economic points of view, that the establishment of an automobile plant in Bombay was a practical proposition, an agreement was negotiated with that Corporation providing for the technical data and know-how for the proposed Indian factory. Mr. Walchand

Hirachand confirmed the understanding. It is under this agreement that the Premier Automobile Company has been established in Bombay.

Notwithstanding all our efforts, the Government of India could not be moved to allow the industry to proceed while the Second World War lasted. The story of how the Indian business men in Bombay were unable, chiefly for lack of Government support, to start the industry, with or without foreign aid, has been told more than once. It is difficult to get our countrymen to combine for any beneficent scheme like this so long as Government exercise control or power arbitrarily to regulate the establishment of industries and the supply of foreign material.

(6) The next time I went out of India was in 1946 as the leader of a delegation of nine members of the All-India Manufacturers' Organization, Bombay. The delegation went in a body first to London. We visited many of the industries, textile, engineering and chemical, in Great Britain, including aircraft factories in Bristol and Derby. The leading men in all the factories we visited were most courteous, some were also hospitable, and many of them gave us all the information we wanted.

From England we proceeded to the United States of America and Canada, where too we visited many important industries including the Niagara Falls Hydro-electric Power Station and several large engineering works in Chicago. We spent some days visiting the automobile factories both in Detroit and Windsor across the Channel. We also visited an aircraft factory near New York. As I was personally interested in the T.V.A. (Tennessee Valley Authority) I paid a visit by myself to Knoxville from New York and returned by air.

After completing the tour in the United States of America and Canada some of us visited, in separate batches, industrial establishments in France and other parts of Europe.

Before the delegation left England for the last time, we visited the British Trade Fair in London in December 1946. On our return to India all the members of the delegation co-operated in publishing a report of 298 pages which included the experiences of the members and which contained some suggestions and material of practical value for the rapid development of Indian industries.

THREATS TO NATIONAL SECURITY

Up to this stage the book gives a succinct account of most of my personal work and experience.

I have stated before how I began my career 66 years ago, by joining Government service in Bombay. During this fairly long period I had frequent occasions to study questions of national importance and also to discuss with statesmen, thinkers and writers, both local and foreign, the comparative economic position and status of India in relation to the more progressive countries of the world.

In the course of my experience I had opportunities to devote much attention to the interests of the rural population. This was particularly so while employed on irrigation works in the Bombay Presidency and during administrative work in Mysore. Also, numerous invitations afforded me occasions to visit various States or parts of India and to study requirements and advise on a variety of subjects such as irrigation, water-supply, drainage, public or municipal administration, finance and other problems of national or regional significance.

Questions of economic interest in particular engaged my attention. These have been dealt with in the two books¹ separately published by me. I now feel I should record in this and the subsequent two chapters of this book some of the thoughts and views which have occurred to me on the various practical problems concerning the future of India.

India has now emerged from the position of a Dependency into a Republic. Her present independent position, while providing the opportunity for rapid development and growth, has brought her fresh risks and additional responsibilities. Most risks can be minimised and responsibilities met by appropriate precautionary measures. But there are certain risks of recent origin like the atom and hydrogen bombs which are a threat to the entire world and, as far as can be judged at present, cannot be effectively controlled by any known expedient and may continue to cause anxiety.

¹"Reconstructing India" and "Planned Economy for India "

Threat of Rapid Growth of Population

The population of India continues to grow without corresponding increase in production or income for its satisfactory maintenance. A recent New York message estimated the population of the world in 1943 at 2,316 million. This shows an increase of 700 million over the corresponding figure for 1900. Like China and Japan, India has high birth and death rates. The population of undivided India increased from 353 million in 1931 to 403 million in 1945. After partition, the population of the Indian Union was 337 million, and recent estimates show that it is increasing at the rate of about 3.25 million per annum.

The people of India were shocked by the news and pictures of starvation deaths in the streets of Calcutta in 1943, which appeared in newspapers. It is clear that the country's population has outgrown the available food supply. There are three or four remedial measures the adoption of which may avert depression and disaster or postpone them for the next 50 to 75 years. These may take the form of either growing more food crops or of adopting measures for family planning followed in civilized countries for restricting population. Otherwise this country will not be free from the anxiety of famine.

"Grow More Food" campaign. The Government are now carrying on a "Grow More Food" campaign and urging the people to put as large an area under food crops as they can within the country itself.

They have also imported foodgrains during the last five years at an average rate of about 2.9 million tons per annum. The largest quantity imported was four million tons in 1948-49. The latest decision of Government is to reduce imports progressively, and their aim is to stop the import of foodgrains after 1952. Unless their plans are upset by extraordinary circumstances they believe they have taken measures to make the country self-sufficient in food by that time.

The "Grow More Food" campaign could be effectively put into force by maintaining in every village statistics in the following form.

- (a) Area (acreage) of food crops cultivated.
- (b) Estimates of products, quantities and values of the previous harvest, and

(c) Estimates of reserve foodgrains maintained in each area.

If these statistics are collected and records correctly maintained, the village population will gradually be taught to think in figures and lead a purposeful life

India is a country of uncertain rainfall. There is likely to be dearth or famine in some corner or other almost every year and in some years, as happened in 1943 in Bengal, the area affected may be extensive and cause widespread disaster. Water has to be stored in irrigation reservoirs, constructed as quickly as possible all over the country. The Government of India have already taken some measures in this connection.

Another measure which may be practised, if the Rural Industrialization Scheme, mentioned in a previous chapter, comes into full operation, will be either to make the village group committee responsible for growing more food within the limits of the group area itself, or for so planning the yield from industrial and other products that the local population may have sufficient income to buy the additional food required from outside the area or the country.

Two years' food supply: Also in the Industrialization Scheme, it is proposed that responsibility for storing two years' food supply in each village group area should be entrusted to the Group Development Committee. It is not intended that every family should store two years' supply but that the total supply maintained in the area should be equivalent to two years' requirements for its entire population. Fifty or more years ago, the prosperous residents in the villages of this country took this precaution and usually assumed the responsibility, during ordinary famines, of feeding, wherever possible, the more indigent populations in their midst.

Restricting population: The population is growing at a dangerous pace and unless some measures are taken to restrict it, occasions may be more frequent when large masses stand in peril of dying of starvation. Experience shows that having too many children deprives people of the opportunity of bringing up healthy families and maintaining a settled, comfortable home life

In these days of advanced civilization, individuals are able to maintain a higher standard of living and enjoy more comfortable lives if they avoid large families. Among nations disposed to

regulate their lives by forethought and calculation, the spread of the family planning (birth control) idea has enabled individual couples to control the size of their families and so avoid poverty and distress.

Planned Parenthood Association - For some time past an association has been in existence in America, known as the "Planned Parenthood Association," to carry on propaganda to restrict population by birth control. In this country too, large Women's Conferences, presided over by cultured Indian ladies, held in recent years, have advocated the practice of birth control. If this is not adopted great dangers may overtake large sections of the population through shortage of food supply, particularly during years of scarcity or famine.

Government can do much to spread the principles and practices of the Planned Parenthood Association. They can also establish a branch of the Medical Department to deal with birth control problems by opening clinics and by extensive propaganda.

Effective Defence of the Country

If the country is not adequately prepared for defence there is the risk of invasion by foreign nations, to guard against which it should be fully equipped. The three arms of defence, namely, the Army, the Navy and the Air Force, differing from one another in many respects, should be supplied with modern equipment. Ample provision should be made within the country itself for properly educating and training the forces for effective defence. This requires trained men and adequate armaments. Today, machinery plays a very large part in the defence of a country. India should always present a bold front and show that she is prepared to fight nations which attempt to encroach on her liberties. The people of India may be non-violent among themselves, but they should be prepared, at all times, to defend the country against aggression. To be defenceless in the face of the armed might of so many world powers, is virtually an invitation to aggression.

Training the people - One of the measures whereby a country can be prepared to meet emergencies is shown by Japanese policy before the last World War. Each village group maintained a small percentage of its population (believed to be from two to five per cent) which was trained to fight in battle formation. If

and when war broke out, these trained groups were ready to reinforce any front.

In this mechanical age, the strength of the army lies in the brains of its officers. More and more officers should be recruited from the ranks of the educated. Subject to stipulated tests for merit and capacity, young men from all parts of India and of all communities should be provided equal opportunity for admission to any of the three fighting forces.

One or more colleges have yet to be established to train officers drawn from all parts of the country, for the Army, the Navy and the Air Force. The information available to the public at present under these heads is inadequate. Military science should be given due prominence in university curricula.

Manufacture of arms and armament machinery - Next—if next at all—to the training of men for fighting comes the manufacture of arms and armament machinery. This will be difficult to provide, unless the requisite industries and research are steadily maintained.

The most important source of military power is organized and developed industry and a proper understanding of available raw material resources. Not the least difficult work connected with defence preparations is the manufacture of the latest model battle-ships, U-boats, trucks, aircraft, and other armament which form an essential feature of such preparation. There is urgent need in this country for special study of the defence situation, defence problems and defence machinery, and for independent action to develop armament industries and military resources of every kind.

Information regarding defence arrangements available to the interested public is meagre. It is hoped that the public will be kept informed of the scope and strength of these in future so that they may take an intelligent interest, and be prepared to co-operate with the fighting forces in emergencies. To be prepared for defence is a very great responsibility and, as it is a matter of life and death to the country, it is hoped that only men of patriotism, the highest integrity and practical energy will be placed at the head of such affairs.

In America the more important arms used in the last war were exhibited in Washington for a considerable time, to make them familiar to the people. The writer saw a large collection of these exhibits in Washington in the latter half of 1946. Besides, general

information regarding the strength of the Army, the Navy and the Air Force was available to the public. Only what were considered military secrets were withheld

Atom and Hydrogen Bombs

Another grave threat to public safety to be considered is the atom bomb, now being developed both in the United States of America and Soviet Russia. This matter is also being secretly examined in several other countries of the civilized world. Judging from the effects of its use in Hiroshima and Nagasaki, Japan, during the last war, this weapon bodes no good for humanity. Nothing definite can be said about the future until both the United States and Soviet Russia agree to outlaw this weapon. If this is done, the smaller States will follow their example. If no such understanding is arrived at, the weapon will continue to be a threat to civilization and human safety.

Within the last year or two it is understood that a more terrific, more quick-acting weapon—the Hydrogen Bomb—has been invented.

Difficulties Created by New Economic Philosophies

Socialism : Another source of anxiety is the divergence of views between certain classes of society and the proletariat which has grown through the spread of a new class of economic philosophies. These urge that the differences in income which provide luxuries for some and deny even necessities for many should be wiped out.

A spirit of dissatisfaction has spread on account of some people owning property and others being dependent on wages from these propertied classes.

At present the instruments of production are owned by the propertied classes. Labour, it is said, is exploited and does not receive its full reward for its share in producing wealth.

Persons owning property are able to give employment to labour and appropriate to themselves a proportionately larger share of the profits of an enterprise, thereby creating great inequalities in the standard of living; it is believed there is also a complaint against the prevailing practice of large-scale management and monopoly by capitalist classes, instead of competition in many branches of industry.

Socialism proposes to eliminate all kinds of individual income except wages. It is urged that all income should be earned and that income from such sources as property, inheritance of land, interest and profits should be eliminated.

Socialism holds that the means of production and distribution should be owned and run co-operatively by society as a whole.

Another statement which has come to my notice is. "Socialism would limit private profit to a moderate amount of consumers' goods and to as much purchasers' capital as a single individual working for himself would employ"

Socialism is of different types and exists in various forms. Socialists who hold such views, of one type or another, are in control of industries, business or administration in many parts of the world at the present time.

Communism : The existence of luxurious life for some and poverty for many is a realistic factor. This creates class feeling between the "have's" and "have-not's," and socialism takes varying forms of communism.

While the capitalist, or propertied classes, are limited, the proletariat, who are many, have learnt to combine, defy their employers and force concessions out of them.

Since there is adult suffrage in every democracy, it is openly stated that Governments, even in countries like the United States of America, show a tendency to make concessions to the proletariat in order to win their votes

The four stages of transition from capitalism to communism are stated to be Capitalism, Dictatorship of the proletariat, Socialism and Communism.

In Soviet Russia, democratic socialists are following the extreme tenets of the creed in a persistent manner, and Moscow has become the centre of international communism. Russia seems to be inspiring individuals and communities in many parts of the world with its new creed of communism.

The Soviet Constitution of 1936 provided for collective ownership of the means of production.

Soviet Russia's ideal of economic democracy is stated to be based on rewarding individual initiative in direct ratio to the approximate measure of productivity. But there is no information available to convince the people of fair play

The foregoing description of socialism and communism is taken from the most reliable sources available. Neither of these creeds has been in practice in any consistent shape for a long time, except communism as recognised in Russia.

There is strong opposition to the Soviet creed from large populations in Europe and the United States of America. The world is now distracted by these conflicting economic and political theories or philosophies

Some people regard communism as a salvation, others look upon it as a menace.

Many people are unable to right the wrongs of modern life. It is the anxiety of the people that leads to the growth of communism.

From what has been stated in this chapter, it will be seen that not only the Indian population but the entire human race has within the past 50 years walked into the midst of new risks and terrors for which they were not prepared. With the rapid advance in science and changing economic and political philosophies, no solutions of a lasting character to the difficulties which have arisen can be predicted at the present time

The only practical action now open is to carry on research and maintain a close watch on developments. Two expert committees, one on scientific aspects and the other on economic and other trends, may have to be maintained to carry on a continuous search for precautions and protection against the risks mentioned, to whatever extent they may be of value.

Chapter XVIII

NATIONAL CHARACTER

THE way to build a better nation is to build better individuals. A successful nation is usually composed of citizens, the majority of whom are efficient, of good character and possess a reasonably high sense of duty. An individual who aspires to be trusted should have character. The foundation of business, as we know it, is credit. Credit depends upon confidence, and confidence upon character.

A plan and programme of essential national ideals and duties and of specific policies and practices to give effect to them, under the best advice available, are necessary for a people to build themselves up into an efficient modern nation.

At present an overwhelming majority of the population of India is untrained and undisciplined. Only a small percentage can be said to come up to the desired standard. The great majority are ignorant of even the three R's and are content to follow static, unprogressive policies and traditional practices

Foreign nations cannot be expected to advise Indians on how to develop into an efficient nation. Both the Government and national leaders should assume this responsibility of building a good national character, progressive behaviour and corresponding wholesome habits in the population.

The development of a good national character should form one of the country's long-range policies. This policy should be encouraged by every citizen who wishes to see the Indian nation rise to a position of esteem for efficiency and high character among the nations of the world.

Character and efficiency in the long run lead to high working capacity, comfortable living and longevity. There is vast difference in the standards attained in these respects by the people of an advanced Western country, like the United States of America, and by those of the present-day Indian Union

Education and Poorer Life

It cannot be too often emphasised that one of the main reasons why the average Indian has a low earning capacity is that the great bulk of the country's population is uneducated. Besides illiteracy, what keeps the people poor and inefficient is their lack of regular business habits.

Mainly as a result of these defects the average Indian lives an irregular life, largely based on tradition. He lacks the guidance needed for progressive living. There are, it is true, many shrewd people who, although uneducated, are accustomed to thinking and judging wisely in their limited spheres but, generally speaking, lack of education keeps them shut out by an iron curtain from the higher advantages and refinements of life.

Some citizens, though without education, may through exceptional natural gifts gain influence and prosper, but higher education, disciplined habits and a thought-out plan of life are most valuable to raise the individual's character and standard of living appreciably.

The reason why countries like the United States of America are more prosperous and maintain a high level of civilization and why their people live longer is because they have access to the highest educational facilities obtainable in the world and their people are the best informed on world affairs. They have a set purpose or plan and they work with disciplined habits.

The average American is far better equipped with education, practical skill, mechanical equipment and knowledge of the world. The Americans have great organizing ability and enterprise and they work much harder than the people of India. They lead disciplined lives and hard work not unusually makes them stronger and more efficient for their working life than they would otherwise be. They have leaders of merit and capacity, who have accumulated and mastered the experience of many generations in their respective occupations or callings, to guide them.

In India, on the other hand, the great bulk of the population is uneducated, and large numbers of them, who were hitherto content to follow the way of life of their forefathers, which lacked ambition and enterprise, now find themselves hard put to it to secure a comfortable living in the present-day crowded surroundings.

Lack of education has led to indolence and absence of ambition. The capacity for organization and creative power remains low or altogether lacking. Mainly due to absence of education, the earning power of an average Indian is in practice less than one-tenth of that of an American, and the expectation of life in India is less than one-half of that in America.

One essential prerequisite of progress in India is, therefore, compulsory primary education such as Russia first provided its population with when it began a career of reform. It is hoped that this very grave lacuna will no longer remain unnoticed by our national Government.

In 1946 the writer was told by officials of the Education Department of New York that if a child of school-going age failed to attend an educational institution, the parents were liable to arrest. In India firmness of this type is lacking in the execution of orders, rules and precepts even when set forth as binding.

Certain Basic Ideas of Life and Knowledge of World Affairs

Certain basic ideas may be set forth in this connection which will form a background for reform.

The working power of an average Indian, judged by the results usually available, is exceptionally low. I say exceptionally, because the population is growing more rapidly than the means of subsistence needed to maintain the growth. India, although an agricultural country, fails to grow enough food for its population, and at present is not earning enough by other occupations or pursuits to pay for the requisite import of food from abroad.

One common slogan of the West, the importance of which the Indian citizen has not yet sufficiently grasped, is:

"If you do not work.

Neither shall you eat."

It is by his work that an individual is enabled to earn a living.

Every man should take the responsibility to do sufficient work and gain a satisfactory livelihood for himself and his family, and not be a burden on others. He should do more than that, and normally render any other service to his country and neighbours when he can. Work performed with higher knowledge or skill, capacity or ambition, usually brings a correspondingly higher reward.

To make him efficient, the average Indian must work harder than he does now, must develop disciplined habits and should equip himself, as far as circumstances permit him to do so, with a sound knowledge of general world affairs. Every individual who considers himself progressive should endeavour to acquire such knowledge. If he possesses higher capacity and merit and is inspired by ambition, he ought to put forth his best efforts to do any work which comes his way as efficiently as possible. Every man who has become great owes his achievements to incessant toil.

In India we are not trained to act up to these truths and standards, we are brought up under softer conditions and dreamy ideals, we are not trained to face risks when they arise. The industrial leaders of the West are so trained. They come from a race accustomed to struggle and enterprise.

The Americans are the richest nation today. Their standard of living is the highest in the world, yet when occasion arises for enterprise, they are ready for anything, even to fight and sacrifice their lives.

Our philosophy in India is different; it lacks ambition and hustle.

Americans are not content with mere security in business life. Mr. Sumner Slichter, a Professor of Harvard University, Boston, at a public function in America a couple of years ago, expressed himself as follows:

"Undoubtedly security is worthy of a high place in man's ideals. Let us remember, however, that no nation has achieved greatness simply by striving for security . . . More positive and dynamic ideals are needed in order to bring out the best in men. The nation which wishes to be great must place enterprise ahead of security. The employment opportunities of many depend on the enterprise of a few. The country must therefore regard innovators, experimenters, starters of enterprises as peculiarly useful citizens and go out of its way to furnish them a congenial and hospitable environment."

"It (the country) must strive to increase the proportion of its citizens to become experimenters and innovators who make their living, not by getting on someone else's payroll but creating pay-rolls of their own."

There are other healthy characteristics which modern nations have developed, namely, industry, unity, forethought, ambition, and they have learnt to put forth the necessary amount of work to do things thoroughly.

An example of precision or attempt at thoroughness is given in the life of Mr. Joseph Pulitzer, Master Journalist, of the *New York World*, in the following extract taken from *Pearson's Magazine* for March 1909.

"At the call of his newspapers, his (Mr. Pulitzer's) mental and moral powers fall into instant order and he will struggle for hours to get a fact or a thought in its most powerful and striking relationship, or feel out a single phrase or even a word in its nicest, most exact and unforgettable sense to startle and convince This is the result of discipline"

In the present crowded state of the world, sound habits and good behaviour are indispensable for every community to constitute itself a body of successful business men The average citizen will learn from experience that what keeps him in sound health and prolongs his life is organized planned work and disciplined habits

Regular hours of work, punctual attendance to duty, standard business habits, appreciation of the value of time are some of the practices which help to improve the individual's chances of attaining a prosperous, care-free, healthy life.

Natural intelligence and capacity may be high or low but they have to be further developed by forethought, industry and will-power to obtain their due reward.

Success in any profession or trade is due largely to the capacity, individuality, integrity and foresight of the person who attains it. Man's success in life depends on man's own exertions Most shipwrecks in life, perhaps all which are not caused by accident (says an old issue of the journal, *Monist*), occur because people follow pleasure and avoid pain. A man whose maxim is to seek pleasure and avoid pain is sure to go to the wall. Mastery over pleasure and pain is the basis of any permanent and well deserved success in life. It is the stamp of dignity that moral actions bear; it is the indispensable condition of a great man's greatness

Rules of Conduct

Any rules to regulate conduct, to be easily remembered by the Indian citizen, should be given in the briefest form. That form is attempted under four heads in what follows:

(i) *Harder work*. The average Indian is inclined to take things easy. The amount of work or effort put in by him in the usual course is small. The efficiency and economic strength of the country are in consequence very low.

In Western countries citizens work harder, the quality of their work is high and, therefore, the income earned and the standard of living maintained both happen to be comparatively far higher.

(ii) *Planned disciplined work*. If work is done in a disciplined manner by assigning to it a fixed number of hours regularly every day, it will considerably enhance the value of effort.

Hard work performed in a disciplined manner will in most cases keep the worker fit and also prolong his life.

The popular belief, that rest under all conditions benefits health, should be discarded. Many people resort to change of work for relief, it is action-cure, not rest cure, in their case.

(iii) *Efficiency*. Efficiency implies the possession, in a high degree, of the qualities of diligence, ambition, punctuality, discipline, precision, and a desire to do one's work of as high a quality as possible. Ordinarily, the higher the quality of work the greater will be the reward.

(iv) *Courtesy and service*. In Western countries the capacity to work in harmony with one's fellow men is highly appreciated. Friendly feeling between individuals to the same extent is lacking in India at present.

The behaviour of every citizen to fellow workers or neighbours should be marked by harmony and courtesy.

The above four precepts should be persistently kept in view by every citizen who wishes to succeed and who expects to be regarded as a worthy member of the community.

These advantageous qualities are not acquired without preparation or training. Such training should be given in educational

institutions, and for the adult population by propaganda under Government direction, as was done in Japan

The circumstance that we are under a national Government has kindled fresh desires and roused new ambitions.

The foregoing four rules have for their aim the promotion of harmony and unity among the people and the enhancement of their sense of duty and responsibility.

NATION-BUILDING AND NATIONAL EFFICIENCY

It is recognized among advanced Western nations that a proper balance should be maintained between a country's productive power, consumers' demands, administrative efficiency, national and international activities, political strength, business pursuits and cultural efficiency. We should, therefore, make a beginning in this country by arranging a thought-out plan of work and enterprise, by the people, for the people, in co-operation with Government to guide future activities and operations into fruitful channels

Nation-building and its object

Planning implies a course of action considered necessary for achieving any particular development, object or purpose. The idea of planning for the public good is inherent in public administration.

An economic plan for a State or region will be a scheme outlining a course of action for increasing the economic strength of the country's population by raising its income, standard of living and material prosperity by making the fullest and most profitable use of its resources and man-power.

Along with economic planning, sooner or later, questions of reform and reconstruction in other spheres of national life—administrative, defence, political, social and cultural—will force themselves to the front. These are interconnected and changes in them, fast or slow, will be inevitable. Planning under all these heads will come under the comprehensive title of national planning or nation-building. If among all these heads economic planning is first effectively brought into operation, it is likely to provide resources for promoting all other purposes of nation building and national efficiency in due course.

The general aim of development measures at the present time should be:

- (1) to find sufficient work and food for the people.
- (2) by increasing work, in quantity and quality, to generate

production, increase employment and raise the income and standard of living, and

- (3) concurrently or gradually to advance other nation-building activities and strive thereby to develop a healthy, strong and prosperous nation, self-contained and self-sufficient in as many respects as possible

A planned life is a desideratum for a nation to acquire economic strength as a preliminary step and, with the aid of that increased strength, endeavour to build up as many of the higher and larger purposes of nation-building as possible. India has had no plan of life, either individual or national. There is no evidence that the economic problem as a whole has ever been faced in this country by any Governmental organization. It has not been the practice to maintain a watch or drive on the progress of national undertakings on any large scale in a business fashion.

There has been no adequate direct approach to problems of immediate concern; even of those like population growth, food supply, removal of illiteracy, manufacture of a complete automobile, aircraft or other high class machinery in this country. The steps taken have been haphazard or half-hearted. Suitable plans or measures for supplying such omissions on a sound technical basis have long been overdue.

National Planning Commission

Government have now set up a National Planning Commission to pay attention to reforms and reconstruction measures urgently needed to promote development work in general

The work to be undertaken immediately by the Commission should be, as stated before, to make the people think more and work more, to supply food first and to obtain a rapid rise in the economic strength and standard of living of the people by efficient exploitation of the country's resources

Whatever new reconstruction measures are planned in future, the specific results, estimated or expected, under each plan or scheme should be unequivocally stated as well as the time within which they could be realized.

Enumeration of Subjects connected with Nation-building

It is desirable that statements or lists of most known wants and deficiencies entitled to a place in a national plan and programme should be available to the Planning Commission. The following is a rough summary of a few such subjects :

(i) *Group of reforms and developments of obvious urgency or importance*

As there is a paucity of funds, effect can be given at the outset only to a few of the more urgent or important among these.

The average citizen in this country should be reminded that if his acquisitive powers are low, his standard of living poor, it is due to his spirit of content, and imperfect use of his physical and mental powers. He has not been taught that work is the source of all prosperity.

The country's policy should be to induce every worthy citizen to make good use of his time and to work hard for self-support as well as for the support of those depending upon him. He should also strive to contribute, whenever he can, a part of his earnings — however small it may be — towards building up national wealth and security.

Systematic training of the population by the million in primary occupations such as small farmers, craftsmen, and small shopkeepers, should be persistently and unhesitatingly pursued.

Certain industries like steel, machine tools and machinery, automobile, aircraft and shipbuilding which are retarded for reasons not correctly known to the public should be developed and maintained in satisfactory operation. These industries, if properly developed, will give at the same time an abundant supply of qualified technicians for the nation's service.

The industrialization problem as a whole has remained unsolved. Its solution should be taken in hand both by the Government and the business leaders, unless the nation chooses to remain content for all time as an agricultural population.

The Industrialization Scheme, in two parts, now being run by the All-India Manufacturers' Organisation, which has been

before the Government for some time, should be dealt with on its merits unless a distinctly superior plan approved by business men and experts is available as an alternative.

Either part of the scheme can be prepared and supplied to any region at short notice provided the necessary data and statistics are made available

Heavy, large-scale and key industries should be distributed all over the country at the rate of one to three industries to every State.

The responsibility for funds and management of such industries should also be suitably distributed so that all parts of the country may benefit in knowledge and skill and develop the acquisitive spirit

The Central Government will be relieved of much of the heavy responsibility which it has voluntarily taken upon itself but which it will be unable to discharge on the scale needed. It should content itself by giving all reasonable help and practical concessions while maintaining general control in its own hands

Responsibility for giving effect to large schemes of development, such as "Grow More Food" campaign, or maintenance of two years' food supply, should, as already explained, be *localised* as far as possible, or fall finally on the local population of the region who are its true beneficiaries. It is risky to allow further delays to occur in making regional populations to handle and be responsible for such problems

Collection of statistics should be placed on a proper basis. This is an age-old deficiency of our country. Government have begun to take action but the effort made still happens to be inadequate and incomplete.

(ii) *Reforms and developments of a long-range character*

Among the more important deficiencies and wants to meet which special and prolonged efforts would be necessary, the following may be mentioned-

Low level of mass education in the country generally.

Low organizing capacity for production or reconstruction.

Attempts being made to accelerate effort to remedy past retardation of industries are still very feeble

The democratic character of the country's administration, being new, is not yet brought up to the requisite level of efficiency in a variety of directions.

Developments under all these four heads require special and urgent attention. Ideals of public service should be formulated and efficient administration of policies voted by the electorate ensured.

One way to give effect to this section of reforms is by maintaining a constant study and comparison of conditions in India with those in modern progressive countries like the United States of America, Canada or Sweden, and using the lessons derived for guidance and practical action in this country.

(iii) The country's needs in training and educating the population

Since education is the root of all progress, several grave defects which are noticeable in the present condition of education require speedy remedy.

Mass Education: Mass education, which has long been neglected, should be speedily advanced.

Compulsory education should be enforced here with determination, as was done in Soviet Russia, not in the half-hearted fashion in which it is attempted now and then in this country. There may be the difficulty of finding finances but local effort could be stimulated and a knowledge of the three R's spread in other ways. For progress in every field, mass education is an indispensable necessity and basis. The country will not rise to a first class State without it.

Occupational education: Attention has already been invited to the special arrangements necessary for training people by the million as small farmers, craftsmen, and small shopkeepers.

The next higher occupational education will be the training of foremen for factories and of technicians for the managerial grade of large establishments.

Congential opportunities should be provided for giving training to a sufficient number of top grade men of capacity to provide the country with leaders qualified to become organizers, technicians and financiers.

Training in statistics. Statistics are very useful to compare the condition of this country with what it was in the past and to get an idea at what rate and by what means other progressive countries have built up better organizations for themselves than is done in India.

English language as a medium for higher education: Japan benefited greatly by maintaining the English language in her universities from the very start. English helped Japan to maintain close touch in all departments of progress with two of the world's foremost nations, namely, Great Britain and the United States of America. India should not throw away the advantages that she now possesses by retaining English, unless any great change in world conditions justifies the abandonment of its use.

(iv) *Removal of certain traditional anomalies and deficiencies which retard progress*

Men of capacity in every field should be utilized for the country's service provided they have good professional, technical or business qualifications. Too much importance should not be attached to party spirit or other extraneous considerations till a democratic two-party system, after the example of the United Kingdom or the United States of America, grows up to full maturity.

It is one of the basic duties of Government to find occupations for the people, no matter to what community or party they may belong, who are willing to work but who are not able to find employment for themselves.

Nepotism and class preferences are a common fault in official life. The practice of appointing men of the same caste or the same region without regard to qualifications is often noticed. If such practices are not rooted out, the chances of India ever rising above the level of a second class State are slender.

I will quote here what Charles H. Pearson, author of *National Life and Character*, has said on these "popular but highly dangerous" practices:

"In the countries where promotion of merit is now practically unknown, responsible mediocrity and a

tame discharge of routine duties have come to be the almost inevitable notes of the junior men in the Civil Service. If, therefore, as seems probable, the State is continually extending its control over industry, and is taking men more and more into its pay, not only will the stimulus of competition, which has often perhaps been excessive, be removed throughout the services, but the standard of work in all departments is likely to be kept at so low a level that a great school of training for character will be lost."

Bearing such experiences in mind, Government should appoint a small committee of true patriotic leaders who believe in rectitude of conduct to search for and select men of merit and capacity for all special and key Government appointments.

The men chosen should be able to practice, in a high degree, precision, thoroughness, efficiency and moral sense in transacting Government business.

Some business practices and methods in India which are still imperfect have to be corrected by giving special business training, as in America. The best known colleges and schools which are giving such training and which may be taken as examples are found in the city of Boston (Massachusetts) in the United States of America.

Lack of system and rules governing the conduct of persons in Government service should be remedied. A suitable business system and rules for correct official conduct should be devised and introduced in official circles. The writer had issued a set of rules to enforce official discipline, under the title "Efficiency Audit," in the administration of an Indian State. The absence of such rules in certain branches of public service is found to be a great drawback.

Attention is also invited to certain regular habits and discipline advocated in the working life of the average citizen, under the head 'National Character' in Chapter XVIII.

More use of machinery and machine tools should be encouraged in order to increase production per man-hour and reduce working costs.

(v) *Occupations, etc.*

Occupations: Over 55 million Americans are, it is stated, using their brains day after day and year after year in thousands of different trades, crafts, professions and businesses. Their time and ability are spent in a never-ending effort to keep America prosperous and secure personal rewards for themselves.

Both in the United States of America and Canada the occupations of the people are grouped or classed under ten heads. The classification is almost the same in this country also. But in America each of the ten main groups is sub-divided into many occupations and a chart is prepared showing the number of men and women employed in each occupation. This gives opportunity to seekers of employment to get a clear picture of the jobs which are followed in any region.

There are also special facilities provided to study the employment situation in near-by cities so that every person in need of a job may choose what promises for him a satisfactory career.

It is necessary to have detailed lists of occupations correctly compiled in India in the same way. It is hoped that the present census will supply this need.

National character: National character should be watched and promoted by the National Planning Commission.

National character will not develop automatically. It has to be built up by discipline and by observance of precepts of the character advocated in the previous chapter.

National security: We have already dealt with threats to national security in Chapter XVII. The risks referred to apply not only to India but to many other parts of the world. The action to be taken, so far as is known, is that India too should maintain investigation and research and keep a watch over changes in the character of these risks

Notice should also be taken of other smaller or minor threats. One of them is the uninterrupted maintenance of liquid fuel now extensively used for motor traffic and aircraft. In an emergency like war, locomotion may be greatly interfered with if the supply of liquid fuel is cut off. Such risks also

require forethought and timely precautions by the responsible Government agencies

A Five-Year Plan

The National Planning Commission may effectively deal with the country's problems embodied in the five groups of subjects just mentioned. To assist in this responsible work, the Commission will, it is presumed, employ in its service and under its control three Bureaux or Boards, as explained below, to attend to the detailed duties of investigation and research to supply data and materials needed for the preparation of the Commission's plans and programmes

Bureau No 1: Administration including national and international problems and defence.

Bureau No 2: Plans and problems of economic import or interest including industries, agriculture, trade, transport, education, etc

Bureau No 3: All other reforms and developments—social, cultural.

Preference should be given first, as urged before, to plans which are likely to improve the finances or resources of the State.

Over all the above heads, a close watch should be maintained by the Bureaux concerned, and all desirable information and data collected should be placed before the Commission from time to time for the preparation of plans or schemes as required. They will include deficiencies and wants in each section of national activities under the five heads mentioned above.

The National Planning Commission should first prepare a five-year plan and before the beginning of each year, a plan of action for the following year.

Five-year plans have come to be popular on account of the known revolutionary developments such plans brought about in Russia. There is no reason why a plan may not be drawn up for any other period, say six years, but with a five-year plan we will be working with a familiar name.

The five-year plan may be also revised as changes in circumstances necessitate from year to year.

If the National Planning Commission thinks fit, a ten-year

plan may be worked out and maintained to serve as a reminder or target

In the selection of new schemes, the National Planning Commission will be guided by the resources which business men in the country can afford to spend or which may be at the disposal of the Government to deal with this class of problems. With the help of the three Bureaux, the Commission will be able to select effectively the more urgent and important reforms and developments for inclusion in the yearly plan and the five-year plan. The Commission will be thus helping the country in nation-building by their continuous effort to choose and prepare the most desirable schemes for action selected in order of urgency and importance.

The National Planning Commission will use all its powers to ensure that the country is growing in economic strength and national efficiency from stage to stage.

When a scheme is sanctioned arrangements should be made to maintain a drive so that the estimated rate of progress may be maintained without interruption.

When a desirable or useful scheme lacks funds for its execution, it should not be laid aside. The public should be kept alive to its necessity by propaganda and the scheme should be taken up again as soon as funds become available.

The three Bureaux mentioned will, in addition to carrying on investigation and research, watch progress and bring to the notice of the National Planning Commission all favourable opportunities for progress to be availed of, and all obstacles or stumbling blocks to be surmounted.

During all this time the resources of the country should be watched closely and their growth in every direction kept in view while framing periodical plans.

India should take into account the experience which countries like the United States of America and Japan had to pass through before they began to exercise influence in the economic affairs of the world. The deficiencies and wants of India as a whole should be under close study by the Government, the National Planning Commission, and the three Bureaux mentioned.

I would, in conclusion, invite attention particularly to the necessity of removing, at the earliest possible moment, the defects in discipline, and working efficiency in general, of our people,

in order that the country might speedily rise in business capacity and economic strength to the level of the world's more successful nations.

One important development in future will have to be that the responsibility for rectifying deficiencies and effecting improvements and developments of a nation-wide character should be localised, that is, suitably sub-divided and shared even by small regions, as far as possible, in proportion to their population and resources. If proper statistics are maintained, a correct picture of almost every phase of development needed, whether in a region or a State or in the country as a whole, would be always available for guidance.

The policies in the immediate future should, therefore, be to localise effort connected with large-scale developments by subdividing and distributing work over wide areas to promote self-help. Certain national policies and useful practices will have to be standardised and rendered popular in order to increase production and service and thereby provide the additional employment that is needed to protect people from poverty and destitution.

The steps to be taken to build up the Indian nation should begin, by removing the weak points in the economic sphere and strengthening the equipment in the political and moral spheres, as economic resources render constructive measures possible.

It has been repeatedly suggested that problems connected with economic strength should be actively pursued in the first instance in order to create new sources of income. Vast new resources will be needed to provide the many other varieties of equipment and requirements to prepare India for her higher destiny.

It is desirable to strengthen the administration by studying the examples and practices suited to this country, in the spirit of what men like Washington and Lincoln did to build up the sister Republic of America. The best way to get results similar to theirs would be to make a special selection of able, patriotic, selfless men to serve in as many key appointments of the State service as possible. Good men already in the service should be encouraged. It cannot be said that if a close, conscientious search be made for men of character and capacity, persons of the requisite calibre could not be found among the 350 million population who inhabit the Indian Union at the present time.

To whatever extent the ideals and systems of behaviour, set forth in this and the two preceding chapters, are accepted and acted upon by the average Indian citizen, a rise to a corresponding extent may be expected in his working power, sense of duty and prospects of self-sufficiency and success

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